

SEQUENCE LISTING

<110> Kukolj, George and Pause, Armin

<120> SELF REPLICATING RNA MOLECULE FROM
HEPATITIS C VIRUS

<130> 13/083-3-D2

<140> To be assigned

<141> 2002-12-04

<150> 60/257,857

<151> 2000-12-22

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| Ser | Gln | Gln | Thr | Arg | Gly | Leu | Leu | Gly | Cys | Ile | Ile | Thr | Ser | Leu | Thr | | | | | |
| | 225 | | | | | 230 | | | | | 235 | | | | | | | | | |
| ggc | cgg | gac | agg | aac | cag | gtc | gag | ggg | gag | gtc | caa | gtg | gtc | tcc | acc | 2567 | | | | |
| Gly | Arg | Asp | Arg | Asn | Gln | Val | Glu | Gly | Glu | Val | Gln | Val | Val | Ser | Thr | | | | | |
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| gca | aca | caa | tct | ttc | ctg | gcg | acc | tgc | gtc | aat | ggc | gtg | tgt | tgg | act | 2615 | | | | |
| Ala | Thr | Gln | Ser | Phe | Leu | Ala | Thr | Cys | Val | Asn | Gly | Val | Cys | Trp | Thr | | | | | |
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| gtc | tat | cat | ggt | gcc | ggc | tca | aag | acc | ctt | gcc | ggc | cca | aag | ggc | cca | 2663 | | | | |
| Val | Tyr | His | Gly | Ala | Gly | Ser | Lys | Thr | Leu | Ala | Gly | Pro | Lys | Gly | Pro | | | | | |
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| atc | acc | caa | atg | tac | acc | aat | gtg | gac | cag | gac | ctc | gtc | ggc | tgg | caa | 2711 | | | | |
| Ile | Thr | Gln | Met | Tyr | Thr | Asn | Val | Asp | Gln | Asp | Leu | Val | Gly | Trp | Gln | | | | | |
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| gcg | ccc | ccc | ggg | gcg | cgt | tcc | ttg | aca | cca | tgc | acc | tgc | ggc | agc | tcg | 2759 | | | | |
| Ala | Pro | Pro | Gly | Ala | Arg | Ser | Leu | Thr | Pro | Cys | Thr | Cys | Gly | Ser | Ser | | | | | |
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| Asp | Leu | Tyr | Leu | Val | Thr | Arg | His | Ala | Asp | Val | Ile | Pro | Val | Arg | Arg | | | | | |
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| cgg | ggc | gac | agc | agg | ggg | agc | cta | ctc | tcc | ccc | agg | ccc | gtc | tcc | tac | 2855 | | | | |
| Arg | Gly | Asp | Ser | Arg | Gly | Ser | Leu | Leu | Ser | Pro | Arg | Pro | Val | Ser | Tyr | | | | | |
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| Leu | Lys | Gly | Ser | Ser | Gly | Gly | Pro | Leu | Leu | Cys | Pro | Ser | Gly | His | Ala | | | | | |
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| Val | Gly | Ile | Phe | Arg | Ala | Ala | Val | Cys | Thr | Arg | Gly | Val | Ala | Lys | Ala | | | | | |
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| gtg | gac | ttt | gta | ccc | gtc | gag | tct | atg | gaa | acc | act | atg | cgg | tcc | ccg | 2999 | | | | |
| Val | Asp | Phe | Val | Pro | Val | Glu | Ser | Met | Glu | Thr | Thr | Met | Arg | Ser | Pro | | | | | |
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| gtc | ttc | acg | gac | aac | tcg | tcc | cct | ccg | gcc | gta | ccg | cag | aca | ttc | cag | 3047 | | | | |
| Val | Phe | Thr | Asp | Asn | Ser | Ser | Pro | Pro | Ala | Val | Pro | Gln | Thr | Phe | Gln | | | | | |
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| Pro | Ala | Ala | Tyr | Ala | Ala | Gln | Gly | Tyr | Lys | Val | Leu | Val | Leu | Asn | Pro | | |
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| Thr | Asp | Ser | Thr | Thr | Ile | Leu | Gly | Ile | Gly | Thr | Val | Leu | Asp | Gln | Ala | | |
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| Glu | Thr | Ala | Gly | Ala | Arg | Leu | Val | Val | Leu | Ala | Thr | Ala | Thr | Pro | Pro | | |
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| Glu Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn | |
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| Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr | |
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| 785 790 795 | |
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| Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu | |
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| ctg tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc | 4295 |
| Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro | |
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| 850 855 860 | |

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| Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro | |
| 980 985 990 | |
| ctc acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg | 4823 |
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| 995 1000 1005 | |
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| ggc atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt | 4919 |
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| Val | Cys | Ala | Ala | Ile | Leu | Arg | Arg | His | Val | Gly | Pro | Gly | Glu | Gly | Ala | | |
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| His | Gln | Trp | Ile | Asn | Glu | Asp | Cys | Ser | Thr | Pro | Cys | Ser | Gly | Ser | Trp | | |
| 1155 | | | | | | | | 1160 | | | | 1165 | | | | | |
| cta | aga | gat | gtt | tgg | gat | tgg | ata | tgc | acg | gtg | ttg | act | gat | ttc | aag | 5351 | |
| Leu | Arg | Asp | Val | Trp | Asp | Trp | Ile | Cys | Thr | Val | Leu | Thr | Asp | Phe | Lys | | |
| 1170 | | | | | | | | 1175 | | | | 1180 | | | | | |
| acc | tgg | ctc | cag | tcc | aag | ctc | ctg | cgg | cga | ttg | cgg | gga | gtc | ccc | ttc | 5399 | |
| Thr | Trp | Leu | Gln | Ser | Lys | Leu | Leu | Pro | Arg | Leu | Pro | Gly | Val | Pro | Phe | | |
| 1185 | | | | | | | | 1190 | | | | 1195 | | | | | |
| ttc | tca | tgt | caa | cgt | ggg | tac | aag | gga | gtc | tgg | cgg | ggc | gac | ggc | atc | 5447 | |
| Phe | Ser | Cys | Gln | Arg | Gly | Tyr | Lys | Gly | Val | Trp | Arg | Gly | Asp | Gly | Ile | | |
| 1200 | | | | | | | | 1205 | | | | 1210 | | | | | 1215 |
| atg | caa | acc | acc | tgc | cca | tgt | gga | gca | cag | atc | acc | gga | cat | gtg | aaa | 5495 | |
| Met | Gln | Thr | Thr | Cys | Pro | Cys | Gly | Ala | Gln | Ile | Thr | Gly | His | Val | Lys | | |
| 1220 | | | | | | | | 1225 | | | | 1230 | | | | | |
| aac | ggt | tcc | atg | agg | atc | gtg | ggg | cct | agg | acc | tgt | agt | aac | acg | tgg | 5543 | |
| Asn | Gly | Ser | Met | Arg | Ile | Val | Gly | Pro | Arg | Thr | Cys | Ser | Asn | Thr | Trp | | |
| 1235 | | | | | | | | 1240 | | | | 1245 | | | | | |
| cat | gga | aca | ttc | ccc | att | aac | gcg | tac | acc | acg | ggc | ccc | tgc | acg | ccc | 5591 | |
| His | Gly | Thr | Phe | Pro | Ile | Asn | Ala | Tyr | Thr | Thr | Gly | Pro | Cys | Thr | Pro | | |
| 1250 | | | | | | | | 1255 | | | | 1260 | | | | | |
| tcc | ccg | gcg | cca | aat | tat | tct | agg | gcg | ctg | tgg | cgg | gtg | gct | gct | gag | 5639 | |
| Ser | Pro | Ala | Pro | Asn | Tyr | Ser | Arg | Ala | Leu | Trp | Arg | Val | Ala | Ala | Glu | | |
| 1265 | | | | | | | | 1270 | | | | 1275 | | | | | |
| gag | tac | gtg | gag | gtt | acg | cgg | gtg | ggg | gat | ttc | cac | tac | gtg | acg | ggc | 5687 | |
| Glu | Tyr | Val | Glu | Val | Thr | Arg | Val | Gly | Asp | Phe | His | Tyr | Val | Thr | Gly | | |
| 1280 | | | | | | | | 1285 | | | | 1290 | | | | | 1295 |
| atg | acc | act | gac | aac | gta | aag | tgc | ccg | tgt | cag | gtt | ccg | gcc | ccc | gaa | 5735 | |

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|--|
| Met | Thr | Thr | Asp | Asn | Val | Lys | Cys | Pro | Cys | Gln | Val | Pro | Ala | Pro | Glu | | |
| | | | | 1300 | | | | | 1305 | | | | | 1310 | | | |
| ttc | ttc | aca | gaa | gtg | gat | ggg | gtg | cgg | ttg | cac | agg | tac | gct | cca | gcg | 5783 | |
| Phe | Phe | Thr | Glu | Val | Asp | Gly | Val | Arg | Leu | His | Arg | Tyr | Ala | Pro | Ala | | |
| | | | 1315 | | | | | 1320 | | | | | 1325 | | | | |
| tgc | aaa | ccc | ctc | cta | cgg | gag | gag | gtc | aca | ttc | ctg | gtc | ggg | ctc | aat | 5831 | |
| Cys | Lys | Pro | Leu | Leu | Arg | Glu | Glu | Val | Thr | Phe | Leu | Val | Gly | Leu | Asn | | |
| | | 1330 | | | | | 1335 | | | | | 1340 | | | | | |
| caa | tac | ctg | gtt | ggg | tca | cag | ctc | cca | tgc | gag | ccc | gaa | ccg | gac | gta | 5879 | |
| Gln | Tyr | Leu | Val | Gly | Ser | Gln | Leu | Pro | Cys | Glu | Pro | Glu | Pro | Asp | Val | | |
| | 1345 | | | | | 1350 | | | | | 1355 | | | | | | |
| gca | gtg | ctc | act | tcc | atg | ctc | acc | gac | ccc | tcc | cac | att | acg | gcg | gag | 5927 | |
| Ala | Val | Leu | Thr | Ser | Met | Leu | Thr | Asp | Pro | Ser | His | Ile | Thr | Ala | Glu | | |
| 1360 | | | | | 1365 | | | | 1370 | | | | | | 1375 | | |
| acg | gct | aag | cgt | agg | ctg | gcc | agg | gga | tct | ccc | ccc | tcc | ttg | gcc | agc | 5975 | |
| Thr | Ala | Lys | Arg | Arg | Leu | Ala | Arg | Gly | Ser | Pro | Pro | Ser | Leu | Ala | Ser | | |
| | | | | 1380 | | | | | 1385 | | | | | 1390 | | | |
| tca | tca | gct | agc | cag | ctg | tct | gcg | cct | tcc | ttg | aag | gca | aca | tgc | act | 6023 | |
| Ser | Ser | Ala | Ser | Gln | Leu | Ser | Ala | Pro | Ser | Leu | Lys | Ala | Thr | Cys | Thr | | |
| | | | 1395 | | | | | 1400 | | | | | 1405 | | | | |
| acc | cgt | cat | gac | tcc | ccg | gac | gct | gac | ctc | atc | gag | gcc | aac | ctc | ctg | 6071 | |
| Thr | Arg | His | Asp | Ser | Pro | Asp | Ala | Asp | Leu | Ile | Glu | Ala | Asn | Leu | Leu | | |
| | | 1410 | | | | | 1415 | | | | | 1420 | | | | | |
| tgg | cgg | cag | gag | atg | ggc | ggg | aac | atc | acc | cgc | gtg | gag | tca | gaa | aat | 6119 | |
| Trp | Arg | Gln | Glu | Met | Gly | Gly | Asn | Ile | Thr | Arg | Val | Glu | Ser | Glu | Asn | | |
| | 1425 | | | | | 1430 | | | | | 1435 | | | | | | |
| aag | gta | gta | att | ttg | gac | tct | ttc | gag | ccg | ctc | caa | gcg | gag | gag | gat | 6167 | |
| Lys | Val | Val | Ile | Leu | Asp | Ser | Phe | Glu | Pro | Leu | Gln | Ala | Glu | Glu | Asp | | |
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| gag | agg | gaa | gta | tcc | gtt | ccg | gcg | gag | atc | ctg | cgg | agg | tcc | agg | aaa | 6215 | |
| Glu | Arg | Glu | Val | Ser | Val | Pro | Ala | Glu | Ile | Leu | Arg | Arg | Ser | Arg | Lys | | |
| | | | | 1460 | | | | | 1465 | | | | | 1470 | | | |
| ttc | cct | cga | gcg | atg | ccc | ata | tgg | gca | cgc | ccg | gat | tac | aac | cct | cca | 6263 | |
| Phe | Pro | Arg | Ala | Met | Pro | Ile | Trp | Ala | Arg | Pro | Asp | Tyr | Asn | Pro | Pro | | |
| | | | 1475 | | | | | 1480 | | | | | 1485 | | | | |
| ctg | tta | gag | tcc | tgg | aag | gac | ccg | gac | tac | gtc | cct | cca | gtg | gta | cac | 6311 | |
| Leu | Leu | Glu | Ser | Trp | Lys | Asp | Pro | Asp | Tyr | Val | Pro | Pro | Val | Val | His | | |
| | | 1490 | | | | | 1495 | | | | | 1500 | | | | | |
| ggg | tgt | cca | ttg | ccg | cct | gcc | aag | gcc | cct | ccg | ata | cca | cct | cca | cgg | 6359 | |
| Gly | Cys | Pro | Leu | Pro | Pro | Ala | Lys | Ala | Pro | Pro | Ile | Pro | Pro | Pro | Arg | | |
| | 1505 | | | | | 1510 | | | | | 1515 | | | | | | |

| | |
|---|------|
| agg aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg | 6407 |
| Arg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu | |
| 1520 1525 1530 1535 | |
| gcg gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc | 6455 |
| Ala Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val | |
| 1540 1545 1550 | |
| gac agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc | 6503 |
| Asp Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly | |
| 1555 1560 1565 | |
| gac gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag | 6551 |
| Asp Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu | |
| 1570 1575 1580 | |
| ggg gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta | 6599 |
| Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val | |
| 1585 1590 1595 | |
| agc gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca | 6647 |
| Ser Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr | |
| 1600 1605 1610 1615 | |
| tgg aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg | 6695 |
| Trp Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu | |
| 1620 1625 1630 | |
| ccc atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc | 6743 |
| Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val | |
| 1635 1640 1645 | |
| tat gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc | 6791 |
| Tyr Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr | |
| 1650 1655 1660 | |
| ttt gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag | 6839 |
| Phe Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys | |
| 1665 1670 1675 | |
| gag atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg | 6887 |
| Glu Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val | |
| 1680 1685 1690 1695 | |
| gag gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt | 6935 |
| Glu Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe | |
| 1700 1705 1710 | |
| ggc tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac | 6983 |
| Gly Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn | |
| 1715 1720 1725 | |
| cac atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca | 7031 |
| His Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro | |
| 1730 1735 1740 | |

| | |
|---|------|
| att gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro 1745 1750 1755 | 7079 |
| gag aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu 1760 1765 1770 1775 | 7127 |
| ggg gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr 1780 1785 1790 | 7175 |
| ctc cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct Leu Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro 1795 1800 1805 | 7223 |
| gga cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc Gly Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys 1810 1815 1820 | 7271 |
| cct atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act Pro Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr 1825 1830 1835 | 7319 |
| gag aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg Glu Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu 1840 1845 1850 1855 | 7367 |
| gcc ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr 1860 1865 1870 | 7415 |
| atc ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg 1875 1880 1885 | 7463 |
| cgg tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu 1890 1895 1900 | 7511 |
| aca tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag Thr Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln 1905 1910 1915 | 7559 |
| gac tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu 1920 1925 1930 1935 | 7607 |
| agc gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag Ser Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu 1940 1945 1950 | 7655 |
| gct atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu | 7703 |

| 1955 | 1960 | 1965 | |
|---|------|------|------|
| tac gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala 1970 1975 1980 | | | 7751 |
| cac gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc His Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr 1985 1990 1995 | | | 7799 |
| acc ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val 2000 2005 2010 2015 | | | 7847 |
| aat tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca Asn Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala 2020 2025 2030 | | | 7895 |
| agg atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa Arg Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu 2035 2040 2045 | | | 7943 |
| caa ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc Gln Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser 2050 2055 2060 | | | 7991 |
| att gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt Ile Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu 2065 2070 2075 | | | 8039 |
| agc gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val 2080 2085 2090 2095 | | | 8087 |
| gct tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga Ala Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg 2100 2105 2110 | | | 8135 |
| cat cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg 2115 2120 2125 | | | 8183 |
| gct gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag Ala Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys 2130 2135 2140 | | | 8231 |
| ctc aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc Leu Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser 2145 2150 2155 | | | 8279 |
| tgg ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct Trp Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser 2160 2165 2170 2175 | | | 8327 |
| cgt gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta | | | 8375 |

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Arg Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val
                2180                      2185                      2190

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Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg *
                2195                      2200

ggccaatagg ccatactggt tttttccctt tttttttttc tttttttttt tttttttttt 8488
tttttttttt tttttctcct ttttttttct ctttttttcc ttttctttcc tttgggtggct 8548
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<213> HCV

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<223> r = a or g

<221> variation
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<223> r = a or g

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gacgaccggg tcctttcttg gatcaaccgg ctcaatgcct ggagatttgg gcgtgcccc 240
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 ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
 Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
 20 25 30

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 Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
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 caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993
 Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
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 Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
 65 70 75 80

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 Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
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 Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
 115 120 125

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 Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
 130 135 140

 acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg 2281
 Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
 145 150 155 160

 gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc 2329
 Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
 165 170 175

 tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc 2377
 Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
 180 185 190

 gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc 2425
 Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser

| 195 | 200 | 205 | |
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| ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210 215 220 | | | 2473 |
| caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240 | | | 2521 |
| cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255 | | | 2569 |
| aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270 | | | 2617 |
| tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285 | | | 2665 |
| acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300 | | | 2713 |
| ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320 | | | 2761 |
| ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335 | | | 2809 |
| ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350 | | | 2857 |
| aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365 | | | 2905 |
| ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380 | | | 2953 |
| gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val 385 390 395 400 | | | 3001 |
| ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val 405 410 415 | | | 3049 |
| gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg | | | 3097 |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Ala | His | Leu | His | Ala | Pro | Thr | Gly | Ser | Gly | Lys | Ser | Thr | Lys | Val | Pro | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | |
| gct | gcg | tat | gca | gcc | caa | ggg | tat | aag | gtg | ctt | gtc | ctg | aac | ccg | tcc | 3145 | |
| Ala | Ala | Tyr | Ala | Ala | Gln | Gly | Tyr | Lys | Val | Leu | Val | Leu | Asn | Pro | Ser | | |
| | | 435 | | | | 440 | | | | 445 | | | | | | | |
| gtc | gcc | gcc | acc | cta | ggg | ttc | ggg | gcg | tat | atg | tct | aag | gca | cat | ggg | 3193 | |
| Val | Ala | Ala | Thr | Leu | Gly | Phe | Gly | Ala | Tyr | Met | Ser | Lys | Ala | His | Gly | | |
| | 450 | | | | 455 | | | | | 460 | | | | | | | |
| atc | gac | cct | aac | atc | aga | acc | ggg | gta | agg | acc | atc | acc | acg | ggg | gcc | 3241 | |
| Ile | Asp | Pro | Asn | Ile | Arg | Thr | Gly | Val | Arg | Thr | Ile | Thr | Thr | Gly | Ala | | |
| 465 | | | | | 470 | | | | 475 | | | | | | 480 | | |
| ccc | atc | acg | tac | tcc | acc | tat | ggc | aag | ttt | ctt | gcc | gac | ggg | ggg | tgc | 3289 | |
| Pro | Ile | Thr | Tyr | Ser | Thr | Tyr | Gly | Lys | Phe | Leu | Ala | Asp | Gly | Gly | Cys | | |
| | | | | 485 | | | | | 490 | | | | | 495 | | | |
| tct | ggg | ggc | gcc | tat | gac | atc | ata | ata | tgt | gat | gag | tgc | cac | tca | act | 3337 | |
| Ser | Gly | Gly | Ala | Tyr | Asp | Ile | Ile | Ile | Cys | Asp | Glu | Cys | His | Ser | Thr | | |
| | | | 500 | | | | | 505 | | | | | 510 | | | | |
| gac | tcg | acc | act | atc | ctg | ggc | atc | ggc | aca | gtc | ctg | gac | caa | gcg | gag | 3385 | |
| Asp | Ser | Thr | Thr | Ile | Leu | Gly | Ile | Gly | Thr | Val | Leu | Asp | Gln | Ala | Glu | | |
| | | 515 | | | | 520 | | | | | | 525 | | | | | |
| acg | gct | gga | gcg | cga | ctc | gtc | gtg | ctc | gcc | acc | gct | acg | cct | ccg | gga | 3433 | |
| Thr | Ala | Gly | Ala | Arg | Leu | Val | Val | Leu | Ala | Thr | Ala | Thr | Pro | Pro | Gly | | |
| | 530 | | | | | 535 | | | | | 540 | | | | | | |
| tcg | gtc | acc | gtg | cca | cat | cca | aac | atc | gag | gag | gtg | gct | ctg | tcc | agc | 3481 | |
| Ser | Val | Thr | Val | Pro | His | Pro | Asn | Ile | Glu | Glu | Val | Ala | Leu | Ser | Ser | | |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 | | |
| act | gga | gaa | atc | ccc | ttt | tat | ggc | aaa | gcc | atc | ccc | atc | gag | acc | atc | 3529 | |
| Thr | Gly | Glu | Ile | Pro | Phe | Tyr | Gly | Lys | Ala | Ile | Pro | Ile | Glu | Thr | Ile | | |
| | | | 565 | | | | | 570 | | | | | | 575 | | | |
| aag | ggg | ggg | agg | cac | ctc | att | ttc | tgc | cat | tcc | aag | aag | aaa | tgt | gat | 3577 | |
| Lys | Gly | Gly | Arg | His | Leu | Ile | Phe | Cys | His | Ser | Lys | Lys | Lys | Cys | Asp | | |
| | | | 580 | | | | | 585 | | | | | 590 | | | | |
| gag | ctc | gcc | gcg | aag | ctg | tcc | ggc | ctc | gga | ctc | aat | gct | gta | gca | tat | 3625 | |
| Glu | Leu | Ala | Ala | Lys | Leu | Ser | Gly | Leu | Gly | Leu | Asn | Ala | Val | Ala | Tyr | | |
| | | 595 | | | | | 600 | | | | | 605 | | | | | |
| tac | cgg | ggc | ctt | gat | gta | tcc | gtc | ata | cca | act | agc | gga | gac | gtc | att | 3673 | |
| Tyr | Arg | Gly | Leu | Asp | Val | Ser | Val | Ile | Pro | Thr | Ser | Gly | Asp | Val | Ile | | |
| | 610 | | | | | 615 | | | | | 620 | | | | | | |
| gtc | gta | gca | acg | gac | gct | cta | atg | acg | ggc | ttt | acc | ggc | gat | ttc | gac | 3721 | |
| Val | Val | Ala | Thr | Asp | Ala | Leu | Met | Thr | Gly | Phe | Thr | Gly | Asp | Phe | Asp | | |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 | | |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| tca | gtg | atc | gac | tgc | aat | aca | tgt | gtc | acc | cag | aca | gtc | gac | ttc | agc | 3769 |
| Ser | Val | Ile | Asp | Cys | Asn | Thr | Cys | Val | Thr | Gln | Thr | Val | Asp | Phe | Ser | |
| | | | | 645 | | | | | 650 | | | | | 655 | | |
| ctg | gac | ccg | acc | ttc | acc | att | gag | acg | acg | acc | gtg | cca | caa | gac | gcg | 3817 |
| Leu | Asp | Pro | Thr | Phe | Thr | Ile | Glu | Thr | Thr | Thr | Val | Pro | Gln | Asp | Ala | |
| | | | 660 | | | | | 665 | | | | | 670 | | | |
| gtg | tca | cgc | tcg | cag | cgg | cga | ggc | agg | act | ggt | agg | ggc | agg | atg | ggc | 3865 |
| Val | Ser | Arg | Ser | Gln | Arg | Arg | Gly | Arg | Thr | Gly | Arg | Gly | Arg | Met | Gly | |
| | | 675 | | | | | 680 | | | | | 685 | | | | |
| att | tac | agg | ttt | gtg | act | cca | gga | gaa | cgg | ccc | tcg | ggc | atg | ttc | gat | 3913 |
| Ile | Tyr | Arg | Phe | Val | Thr | Pro | Gly | Glu | Arg | Pro | Ser | Gly | Met | Phe | Asp | |
| | 690 | | | | | 695 | | | | | 700 | | | | | |
| tcc | tcg | gtt | ctg | tgc | gag | tgc | tat | gac | gcg | ggc | tgt | gct | tgg | tac | gag | 3961 |
| Ser | Ser | Val | Leu | Cys | Glu | Cys | Tyr | Asp | Ala | Gly | Cys | Ala | Trp | Tyr | Glu | |
| 705 | | | | 710 | | | | | | 715 | | | | | 720 | |
| ctc | acg | ccc | gcc | gag | acc | tca | gtt | agg | ttg | cgg | gct | tac | cta | aac | aca | 4009 |
| Leu | Thr | Pro | Ala | Glu | Thr | Ser | Val | Arg | Leu | Arg | Ala | Tyr | Leu | Asn | Thr | |
| | | | | 725 | | | | | 730 | | | | | 735 | | |
| cca | ggg | ttg | ccc | gtc | tgc | cag | gac | cat | ctg | gag | ttc | tgg | gag | agc | gtc | 4057 |
| Pro | Gly | Leu | Pro | Val | Cys | Gln | Asp | His | Leu | Glu | Phe | Trp | Glu | Ser | Val | |
| | | | 740 | | | | | 745 | | | | | 750 | | | |
| ttt | aca | ggc | ctc | acc | cac | ata | gac | gcc | cat | ttc | ttg | tcc | cag | act | aag | 4105 |
| Phe | Thr | Gly | Leu | Thr | His | Ile | Asp | Ala | His | Phe | Leu | Ser | Gln | Thr | Lys | |
| | | 755 | | | | | 760 | | | | | 765 | | | | |
| cag | gca | gga | gac | aac | ttc | ccc | tac | ctg | gta | gca | tac | cag | gct | acg | gtg | 4153 |
| Gln | Ala | Gly | Asp | Asn | Phe | Pro | Tyr | Leu | Val | Ala | Tyr | Gln | Ala | Thr | Val | |
| | 770 | | | | | 775 | | | | | 780 | | | | | |
| tgc | gcc | agg | gct | cag | gct | cca | cct | cca | tcg | tgg | gac | caa | atg | tgg | aag | 4201 |
| Cys | Ala | Arg | Ala | Gln | Ala | Pro | Pro | Pro | Ser | Trp | Asp | Gln | Met | Trp | Lys | |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 | |
| tgt | ctc | ata | cgg | cta | aag | cct | acg | ctg | cac | ggg | cca | acg | ccc | ctg | ctg | 4249 |
| Cys | Leu | Ile | Arg | Leu | Lys | Pro | Thr | Leu | His | Gly | Pro | Thr | Pro | Leu | Leu | |
| | | | | 805 | | | | | 810 | | | | | 815 | | |
| tat | agg | ctg | gga | gcc | gtt | caa | aac | gag | gtt | act | acc | aca | cac | ccc | ata | 4297 |
| Tyr | Arg | Leu | Gly | Ala | Val | Gln | Asn | Glu | Val | Thr | Thr | Thr | His | Pro | Ile | |
| | | | 820 | | | | | 825 | | | | | 830 | | | |
| acc | aaa | tac | atc | atg | gca | tgc | atg | tcg | gct | gac | ctg | gag | gtc | gtc | acg | 4345 |
| Thr | Lys | Tyr | Ile | Met | Ala | Cys | Met | Ser | Ala | Asp | Leu | Glu | Val | Val | Thr | |
| | | 835 | | | | | 840 | | | | | 845 | | | | |
| agc | acc | tgg | gtg | ctg | gta | ggc | gga | gtc | cta | gca | gct | ctg | gcc | gcg | tat | 4393 |
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | |
| | 850 | | | | | 855 | | | | | 860 | | | | | |

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|---|------|
| tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc | 4441 |
| Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser | |
| 865 870 875 880 | |
| gga arg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc | 4489 |
| Gly Xaa Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe | |
| 885 890 895 | |
| gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga | 4537 |
| Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly | |
| 900 905 910 | |
| atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa | 4585 |
| Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln | |
| 915 920 925 | |
| aca gcc acc aag caa gcg gag gct gct gct ccc gtg gtg gaa tcc aag | 4633 |
| Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys | |
| 930 935 940 | |
| tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc | 4681 |
| Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile | |
| 945 950 955 960 | |
| agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc | 4729 |
| Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro | |
| 965 970 975 | |
| gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc | 4777 |
| Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu | |
| 980 985 990 | |
| acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc | 4825 |
| Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala | |
| 995 1000 1005 | |
| gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc | 4873 |
| Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly | |
| 1010 1015 1020 | |
| atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg | 4921 |
| Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val | |
| 1025 1030 1035 1040 | |
| gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc | 4969 |
| Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala | |
| 1045 1050 1055 | |
| ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac | 5017 |
| Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn | |
| 1060 1065 1070 | |
| cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg | 5065 |
| Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val | |

| 1075 | 1080 | 1085 | |
|---|------|------|------|
| tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg | | | 5113 |
| Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val | | | |
| 1090 | 1095 | 1100 | |
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | | | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | | | |
| 1105 | 1110 | 1115 | 1120 |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | | | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | | | |
| | 1125 | 1130 | 1135 |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | | | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | | | |
| | 1140 | 1145 | 1150 |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | | | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | | | |
| | 1155 | 1160 | 1165 |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc | | | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr | | | |
| | 1170 | 1175 | 1180 |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | | | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | | | |
| | 1185 | 1190 | 1200 |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | | | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | | | |
| | 1205 | 1210 | 1215 |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | | | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | | | |
| | 1220 | 1225 | 1230 |
| tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | | | 5545 |
| Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | | | |
| | 1235 | 1240 | 1245 |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | | | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | | | |
| | 1250 | 1255 | 1260 |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | | | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | | | |
| | 1265 | 1270 | 1275 |
| tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg | | | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | | | |
| | 1285 | 1290 | 1295 |
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | | | 5737 |

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|---|------|
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca | 5881 |
| Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| ttr gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Xaa Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |
| 1505 1510 1515 1520 | |

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|---|------|
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | |
| 1525 1530 1535 | |
| gag ctg gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | |
| 1540 1545 1550 | |
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | 6505 |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | |
| 1555 1560 1565 | |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg | 6553 |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | |
| 1570 1575 1580 | |
| gag ccg ggg gat ccc gat ctg agc gac ggg tct tgg tct acc gta agc | 6601 |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser | |
| 1585 1590 1595 1600 | |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg | 6649 |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | |
| 1605 1610 1615 | |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | 6697 |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | |
| 1620 1625 1630 | |
| atc aat gca ctg agc aac tct ttg ctg cgt cac cac aac ttg gtc tat | 6745 |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | |
| 1635 1640 1645 | |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | 6793 |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | |
| 1650 1655 1660 | |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctg aag gag | 6841 |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | |
| 1665 1670 1675 1680 | |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | 6889 |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | |
| 1685 1690 1695 | |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | 6937 |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | |
| 1700 1705 1710 | |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | 6985 |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | |
| 1715 1720 1725 | |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | 7033 |
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | |
| 1730 1735 1740 | |

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|---|------|
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | |
| 1745 1750 1755 1760 | |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 |
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| 1765 1770 1775 | |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| 1780 1785 1790 | |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 1800 1805 | |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 1815 1820 | |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 1830 1835 1840 | |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 1850 1855 | |
| ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 1865 1870 | |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 1880 1885 | |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 1895 1900 | |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 1910 1915 1920 | |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 1930 1935 | |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 1945 1950 | |
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |

| 1955 | 1960 | 1965 | |
|--|------|------|------|
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 | 1975 | 1980 | 7753 |
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 | 1990 | 1995 | 7801 |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 | 2010 | 2015 | 7849 |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 | 2025 | 2030 | 7897 |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 | 2040 | 2045 | 7945 |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 | 2055 | 2060 | 7993 |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 | 2070 | 2075 | 8041 |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 | 2090 | 2095 | 8089 |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 | 2105 | 2110 | 8137 |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 | 2120 | 2125 | 8185 |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 | 2135 | 2140 | 8233 |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 | 2150 | 2155 | 8281 |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165 | 2170 | 2175 | 8329 |
| gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg | | | 8377 |

Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *
2195 2200

ggccaatagg ccatactgtt tttttcccct tttttttttt tttttttttc tttttttttt 8487
tttttttttt tttttttttc tctttttttt tctctttttt ttcctttttct ttccttttgg 8547
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<221> VARIANT
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<223> Xaa is Leu

<400> 3

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Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
50 55 60
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
65 70 75 80
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
100 105 110
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
130 135 140
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145 150 155 160
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
165 170 175
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
180 185 190
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser
195 200 205
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
210 215 220

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Gln | Thr | Arg | Gly | Leu | Leu | Gly | Cys | Ile | Ile | Thr | Ser | Leu | Thr | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | Asp | Arg | Asn | Gln | Val | Glu | Gly | Glu | Val | Gln | Val | Val | Ser | Thr | Ala |
| | | | | 245 | | | | | 250 | | | | | | 255 |
| Thr | Gln | Ser | Phe | Leu | Ala | Thr | Cys | Val | Asn | Gly | Val | Cys | Trp | Thr | Val |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Tyr | His | Gly | Ala | Gly | Ser | Lys | Thr | Leu | Ala | Gly | Pro | Lys | Gly | Pro | Ile |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Thr | Gln | Met | Tyr | Thr | Asn | Val | Asp | Gln | Asp | Leu | Val | Gly | Trp | Gln | Ala |
| | | 290 | | | | 295 | | | | | 300 | | | | |
| Pro | Pro | Gly | Ala | Arg | Ser | Leu | Thr | Pro | Cys | Thr | Cys | Gly | Ser | Ser | Asp |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Leu | Tyr | Leu | Val | Thr | Arg | His | Ala | Asp | Val | Ile | Pro | Val | Arg | Arg | Arg |
| | | | | 325 | | | | | 330 | | | | | | 335 |
| Gly | Asp | Ser | Arg | Gly | Ser | Leu | Leu | Ser | Pro | Arg | Pro | Val | Ser | Tyr | Leu |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Lys | Gly | Ser | Ser | Gly | Gly | Pro | Leu | Leu | Cys | Pro | Ser | Gly | His | Ala | Val |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Gly | Ile | Phe | Arg | Ala | Ala | Val | Cys | Thr | Arg | Gly | Val | Ala | Lys | Ala | Val |
| | | 370 | | | | 375 | | | | | 380 | | | | |
| Asp | Phe | Val | Pro | Val | Glu | Ser | Met | Glu | Thr | Thr | Met | Arg | Ser | Pro | Val |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Phe | Thr | Asp | Asn | Ser | Ser | Pro | Pro | Ala | Val | Pro | Gln | Thr | Phe | Gln | Val |
| | | | 405 | | | | | | 410 | | | | | 415 | |
| Ala | His | Leu | His | Ala | Pro | Thr | Gly | Ser | Gly | Lys | Ser | Thr | Lys | Val | Pro |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Ala | Ala | Tyr | Ala | Ala | Gln | Gly | Tyr | Lys | Val | Leu | Val | Leu | Asn | Pro | Ser |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Val | Ala | Ala | Thr | Leu | Gly | Phe | Gly | Ala | Tyr | Met | Ser | Lys | Ala | His | Gly |
| | | 450 | | | | 455 | | | | | 460 | | | | |
| Ile | Asp | Pro | Asn | Ile | Arg | Thr | Gly | Val | Arg | Thr | Ile | Thr | Thr | Gly | Ala |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Pro | Ile | Thr | Tyr | Ser | Thr | Tyr | Gly | Lys | Phe | Leu | Ala | Asp | Gly | Gly | Cys |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Ser | Gly | Gly | Ala | Tyr | Asp | Ile | Ile | Ile | Cys | Asp | Glu | Cys | His | Ser | Thr |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Asp | Ser | Thr | Thr | Ile | Leu | Gly | Ile | Gly | Thr | Val | Leu | Asp | Gln | Ala | Glu |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Thr | Ala | Gly | Ala | Arg | Leu | Val | Val | Leu | Ala | Thr | Ala | Thr | Pro | Pro | Gly |
| | | 530 | | | | 535 | | | | | 540 | | | | |
| Ser | Val | Thr | Val | Pro | His | Pro | Asn | Ile | Glu | Glu | Val | Ala | Leu | Ser | Ser |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Thr | Gly | Glu | Ile | Pro | Phe | Tyr | Gly | Lys | Ala | Ile | Pro | Ile | Glu | Thr | Ile |
| | | | | 565 | | | | | 570 | | | | | 575 | |
| Lys | Gly | Gly | Arg | His | Leu | Ile | Phe | Cys | His | Ser | Lys | Lys | Lys | Cys | Asp |
| | | | 580 | | | | | 585 | | | | | 590 | | |
| Glu | Leu | Ala | Ala | Lys | Leu | Ser | Gly | Leu | Gly | Leu | Asn | Ala | Val | Ala | Tyr |
| | | 595 | | | | | 600 | | | | | 605 | | | |
| Tyr | Arg | Gly | Leu | Asp | Val | Ser | Val | Ile | Pro | Thr | Ser | Gly | Asp | Val | Ile |
| | | 610 | | | | 615 | | | | | 620 | | | | |
| Val | Val | Ala | Thr | Asp | Ala | Leu | Met | Thr | Gly | Phe | Thr | Gly | Asp | Phe | Asp |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 |
| Ser | Val | Ile | Asp | Cys | Asn | Thr | Cys | Val | Thr | Gln | Thr | Val | Asp | Phe | Ser |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| Leu | Asp | Pro | Thr | Phe | Thr | Ile | Glu | Thr | Thr | Thr | Val | Pro | Gln | Asp | Ala |

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|-----|------|------|------|------|-----|------|------|------|------|------|------|--|--|
| | | | 660 | | | | | 665 | | | | | 670 | | | | |
| Val | Ser | Arg | Ser | Gln | Arg | Arg | Gly | Arg | Thr | Gly | Arg | Gly | Arg | Met | Gly | | |
| | | 675 | | | | | 680 | | | | | 685 | | | | | |
| Ile | Tyr | Arg | Phe | Val | Thr | Pro | Gly | Glu | Arg | Pro | Ser | Gly | Met | Phe | Asp | | |
| | 690 | | | | | 695 | | | | | 700 | | | | | | |
| Ser | Ser | Val | Leu | Cys | Glu | Cys | Tyr | Asp | Ala | Gly | Cys | Ala | Trp | Tyr | Glu | | |
| 705 | | | | 710 | | | | | | 715 | | | | | 720 | | |
| Leu | Thr | Pro | Ala | Glu | Thr | Ser | Val | Arg | Leu | Arg | Ala | Tyr | Leu | Asn | Thr | | |
| | | | 725 | | | | | 730 | | | | | | 735 | | | |
| Pro | Gly | Leu | Pro | Val | Cys | Gln | Asp | His | Leu | Glu | Phe | Trp | Glu | Ser | Val | | |
| | | 740 | | | | | 745 | | | | | | 750 | | | | |
| Phe | Thr | Gly | Leu | Thr | His | Ile | Asp | Ala | His | Phe | Leu | Ser | Gln | Thr | Lys | | |
| | 755 | | | | | 760 | | | | | | 765 | | | | | |
| Gln | Ala | Gly | Asp | Asn | Phe | Pro | Tyr | Leu | Val | Ala | Tyr | Gln | Ala | Thr | Val | | |
| | 770 | | | | | 775 | | | | | 780 | | | | | | |
| Cys | Ala | Arg | Ala | Gln | Ala | Pro | Pro | Pro | Ser | Trp | Asp | Gln | Met | Trp | Lys | | |
| 785 | | | | 790 | | | | | | 795 | | | | | 800 | | |
| Cys | Leu | Ile | Arg | Leu | Lys | Pro | Thr | Leu | His | Gly | Pro | Thr | Pro | Leu | Leu | | |
| | | | 805 | | | | | 810 | | | | | | 815 | | | |
| Tyr | Arg | Leu | Gly | Ala | Val | Gln | Asn | Glu | Val | Thr | Thr | Thr | His | Pro | Ile | | |
| | | 820 | | | | | | 825 | | | | | 830 | | | | |
| Thr | Lys | Tyr | Ile | Met | Ala | Cys | Met | Ser | Ala | Asp | Leu | Glu | Val | Val | Thr | | |
| | 835 | | | | | | 840 | | | | | | 845 | | | | |
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | | |
| | 850 | | | | | 855 | | | | | 860 | | | | | | |
| Cys | Leu | Thr | Thr | Gly | Ser | Val | Val | Ile | Val | Gly | Arg | Ile | Ile | Leu | Ser | | |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 | | |
| Gly | Xaa | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Leu | Tyr | Arg | Glu | Phe | | |
| | | | 885 | | | | | 890 | | | | | | 895 | | | |
| Asp | Glu | Met | Glu | Glu | Cys | Ala | Ser | His | Leu | Pro | Tyr | Ile | Glu | Gln | Gly | | |
| | | 900 | | | | | | 905 | | | | | 910 | | | | |
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | | |
| | 915 | | | | | | 920 | | | | | 925 | | | | | |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | | |
| | 930 | | | | | 935 | | | | | 940 | | | | | | |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | | |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 | | |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | | |
| | | | 965 | | | | | 970 | | | | | | 975 | | | |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | | |
| | | 980 | | | | | | 985 | | | | | 990 | | | | |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | | |
| | 995 | | | | | | 1000 | | | | | 1005 | | | | | |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | | |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | | |
| 1025 | | | | | 1030 | | | | | 1035 | | | | | 1040 | | |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | | |
| | | | 1045 | | | | | 1050 | | | | | | 1055 | | | |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | | |
| | | 1060 | | | | | | 1065 | | | | | 1070 | | | | |
| Leu | Leu | Pro | Ala | Ile | Leu | Ser | Pro | Gly | Ala | Leu | Val | Val | Gly | Val | Val | | |
| | | 1075 | | | | | 1080 | | | | | 1085 | | | | | |
| Cys | Ala | Ala | Ile | Leu | Arg | Arg | His | Val | Gly | Pro | Gly | Glu | Gly | Ala | Val | | |
| | 1090 | | | | | 1095 | | | | | | 1100 | | | | | |

| | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| Gln | Trp | Met | Asn | Arg | Leu | Ile | Ala | Phe | Ala | Ser | Arg | Gly | Asn | His | Val | |
| 1105 | | | | | 1110 | | | | | 1115 | | | | | 1120 | |
| Ser | Pro | Thr | His | Tyr | Val | Pro | Glu | Ser | Asp | Ala | Ala | Ala | Arg | Val | Thr | |
| | | | | 1125 | | | | | 1130 | | | | | | 1135 | |
| Gln | Ile | Leu | Ser | Ser | Leu | Thr | Ile | Thr | Gln | Leu | Leu | Lys | Arg | Leu | His | |
| | | | 1140 | | | | | 1145 | | | | | | 1150 | | |
| Gln | Trp | Ile | Asn | Glu | Asp | Cys | Ser | Thr | Pro | Cys | Ser | Gly | Ser | Trp | Leu | |
| | | 1155 | | | | | 1160 | | | | | 1165 | | | | |
| Arg | Asp | Val | Trp | Asp | Trp | Ile | Cys | Thr | Val | Leu | Thr | Asp | Phe | Lys | Thr | |
| | 1170 | | | | | 1175 | | | | | 1180 | | | | | |
| Trp | Leu | Gln | Ser | Lys | Leu | Leu | Pro | Arg | Leu | Pro | Gly | Val | Pro | Phe | Phe | |
| 1185 | | | | 1190 | | | | | | 1195 | | | | | 1200 | |
| Ser | Cys | Gln | Arg | Gly | Tyr | Lys | Gly | Val | Trp | Arg | Gly | Asp | Gly | Ile | Met | |
| | | | | 1205 | | | | | 1210 | | | | | | 1215 | |
| Gln | Thr | Thr | Cys | Pro | Cys | Gly | Ala | Gln | Ile | Thr | Gly | His | Val | Lys | Asn | |
| | | | 1220 | | | | | 1225 | | | | | | 1230 | | |
| Cys | Ser | Met | Arg | Ile | Val | Gly | Pro | Arg | Thr | Cys | Ser | Asn | Thr | Trp | His | |
| | | 1235 | | | | | 1240 | | | | | 1245 | | | | |
| Gly | Thr | Phe | Pro | Ile | Asn | Ala | Tyr | Thr | Thr | Gly | Pro | Cys | Thr | Pro | Ser | |
| | 1250 | | | | | 1255 | | | | | 1260 | | | | | |
| Pro | Ala | Pro | Asn | Tyr | Ser | Arg | Ala | Leu | Trp | Arg | Val | Ala | Ala | Glu | Glu | |
| 1265 | | | | 1270 | | | | | | 1275 | | | | | 1280 | |
| Tyr | Val | Glu | Val | Thr | Arg | Val | Gly | Asp | Phe | His | Tyr | Val | Thr | Gly | Met | |
| | | | | 1285 | | | | | 1290 | | | | | | 1295 | |
| Thr | Thr | Asp | Asn | Val | Lys | Cys | Pro | Cys | Gln | Val | Pro | Ala | Pro | Glu | Phe | |
| | | | 1300 | | | | | 1305 | | | | | 1310 | | | |
| Phe | Thr | Glu | Val | Asp | Gly | Val | Arg | Leu | His | Arg | Tyr | Ala | Pro | Ala | Cys | |
| | | 1315 | | | | | 1320 | | | | | 1325 | | | | |
| Lys | Pro | Leu | Leu | Arg | Glu | Glu | Val | Thr | Phe | Leu | Val | Gly | Leu | Asn | Gln | |
| | 1330 | | | | | 1335 | | | | | 1340 | | | | | |
| Tyr | Leu | Val | Gly | Ser | Gln | Leu | Pro | Cys | Glu | Pro | Glu | Pro | Asp | Val | Ala | |
| 1345 | | | | 1350 | | | | | | 1355 | | | | | 1360 | |
| Val | Leu | Thr | Ser | Met | Leu | Thr | Asp | Pro | Ser | His | Ile | Thr | Ala | Glu | Thr | |
| | | | | 1365 | | | | | 1370 | | | | | 1375 | | |
| Ala | Lys | Arg | Arg | Leu | Ala | Arg | Gly | Ser | Pro | Pro | Ser | Leu | Ala | Ser | Ser | |
| | | | 1380 | | | | | 1385 | | | | | 1390 | | | |
| Ser | Ala | Ser | Gln | Leu | Ser | Ala | Pro | Ser | Leu | Lys | Ala | Thr | Cys | Thr | Thr | |
| | | 1395 | | | | | 1400 | | | | | 1405 | | | | |
| Arg | His | Asp | Ser | Pro | Asp | Ala | Asp | Leu | Ile | Glu | Ala | Asn | Leu | Leu | Trp | |
| | 1410 | | | | | 1415 | | | | | 1420 | | | | | |
| Arg | Gln | Glu | Met | Gly | Gly | Asn | Ile | Thr | Arg | Val | Glu | Ser | Glu | Asn | Lys | |
| 1425 | | | | 1430 | | | | | | 1435 | | | | | 1440 | |
| Val | Val | Ile | Leu | Asp | Ser | Phe | Glu | Pro | Leu | Gln | Ala | Glu | Glu | Asp | Glu | |
| | | | | 1445 | | | | | 1450 | | | | | 1455 | | |
| Arg | Glu | Val | Ser | Val | Pro | Ala | Glu | Ile | Leu | Arg | Arg | Ser | Arg | Lys | Phe | |
| | | | 1460 | | | | | 1465 | | | | | 1470 | | | |
| Pro | Arg | Ala | Met | Pro | Ile | Trp | Ala | Arg | Pro | Asp | Tyr | Asn | Pro | Pro | Leu | |
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| Xaa | Glu | Ser | Trp | Lys | Asp | Pro | Asp | Tyr | Val | Pro | Pro | Val | Val | His | Gly | |
| | 1490 | | | | | 1495 | | | | | 1500 | | | | | |
| Cys | Pro | Leu | Pro | Pro | Ala | Lys | Ala | Pro | Pro | Ile | Pro | Pro | Pro | Arg | Arg | |
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| Lys | Arg | Thr | Val | Val | Leu | Ser | Glu | Ser | Thr | Val | Ser | Ser | Ala | Leu | Ala | |
| | | | | 1525 | | | | | 1530 | | | | | 1535 | | |
| Glu | Leu | Ala | Thr | Lys | Thr | Phe | Gly | Ser | Ser | Glu | Ser | Ser | Ala | Val | Asp | |

| | | | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| 1540 | | | | | 1545 | | | | | 1550 | | | | | |
| Ser | Gly | Thr | Ala | Thr | Ala | Ser | Pro | Asp | Gln | Pro | Ser | Asp | Asp | Gly | Asp |
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| Ala | Gly | Ser | Asp | Val | Glu | Ser | Tyr | Ser | Ser | Met | Pro | Pro | Leu | Glu | Gly |
| 1570 | | | | | 1575 | | | | | 1580 | | | | | |
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| 1890 | | | | | 1895 | | | | | 1900 | | | | | |
| Cys | Tyr | Leu | Lys | Ala | Ala | Ala | Ala | Cys | Arg | Ala | Ala | Lys | Leu | Gln | Asp |
| 1905 | | | | | 1910 | | | | | 1915 | | | | | |
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| 1955 | | | | | 1960 | | | | | 1965 | | | | | |
| Asp | Leu | Glu | Leu | Ile | Thr | Ser | Cys | Ser | Ser | Asn | Val | Ser | Val | Ala | His |
| 1970 | | | | | 1975 | | | | | 1980 | | | | | |

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| Gly | Arg | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Leu | Tyr | Arg | Glu | Phe | | |
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| | | 1010 | | | | 1015 | | | | | 1020 | | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 | |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | | |
| | | | | | 1030 | | | | | 1035 | | | | | 1040 | | |

| | |
|---|------|
| gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc | 4969 |
| Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala | |
| 1045 1050 1055 | |
| ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac | 5017 |
| Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn | |
| 1060 1065 1070 | |
| cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg | 5065 |
| Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val | |
| 1075 1080 1085 | |
| tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg | 5113 |
| Cys Ala Ala Ile Leu Arg His Val Gly Pro Gly Glu Gly Ala Val | |
| 1090 1095 1100 | |
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | |
| 1105 1110 1115 1120 | |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | |
| 1125 1130 1135 | |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |

| | |
|---|------|
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca | 5881 |
| Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |

| 1475 | 1480 | 1485 | |
|---|------|------|------|
| ttg gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly 1490 1495 1500 | | | 6313 |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg 1505 1510 1515 1520 | | | 6361 |
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525 1530 1535 | | | 6409 |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540 1545 1550 | | | 6457 |
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555 1560 1565 | | | 6505 |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570 1575 1580 | | | 6553 |
| gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585 1590 1595 1600 | | | 6601 |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605 1610 1615 | | | 6649 |
| acg ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620 1625 1630 | | | 6697 |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635 1640 1645 | | | 6745 |
| gct aca aca tct cgc agc gca agc ctg ccg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650 1655 1660 | | | 6793 |
| gac aga ctg cag gtc ctg gac gac cac tac ccg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665 1670 1675 1680 | | | 6841 |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685 1690 1695 | | | 6889 |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | | | 6937 |

| | |
|---|----------------|
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | |
| 1700 | 1705 1710 |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | 6985 |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | |
| 1715 | 1720 1725 |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | 7033 |
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | |
| 1730 | 1735 1740 |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | |
| 1745 | 1750 1755 1760 |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 |
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| 1765 | 1770 1775 |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| 1780 | 1785 1790 |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 | 1800 1805 |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 | 1815 1820 |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 | 1830 1835 1840 |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 | 1850 1855 |
| ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 | 1865 1870 |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 | 1880 1885 |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 | 1895 1900 |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 | 1910 1915 1920 |

| | |
|---|------|
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 1930 1935 | |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 1945 1950 | |
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 1960 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 1975 1980 | |
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 1990 1995 2000 | |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 2010 2015 | |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |

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aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg 8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp
2145                2150                2155                2160

ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt 8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg
                2165                2170                2175

gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg 8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
                2180                2185                2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *
                2195                2200

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ggccaatagg ccatacctggt ttttcccttt tttttttttt tttttttttt tttttttttt 8487
tttttttttt tttttttttt ttttcttttt tcccaatttt tttccttttc tttccttttg 8547
tggctccatc ttagccctag tcacggctag ctgtgaaagg tccgtgagcc gcttgactgc 8607
agagagtgct gatactggcc tctctgcaga tcaagt 8643

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<210> 5
<211> 8648
<212> DNA
<213> HCV

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<220>
<221> CDS
<222> (1802)...(8407)

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```

<400> 5
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tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac 120
ccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag 180
gacgaccggg tcctttcttg gatcaaccgc ctcaatgcct ggagatttgg gcgtgcccc 240
gcgagactgc tagccgagta gtgttggtgc gcgaaaggcc ttgtggtact gcctgatagg 300
gtgcttgcca gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 360
ctcaaagaaa aaccaaaggc cgcgccatga ttgaacaaga tggattgcac gcaggttctc 420
cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct 480
ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgcc ggttcttttt gtcaagaccg 540
acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 600
cgacggcgct tccttgccga gctgtgctcg acgttgtcac tgaagcggga agggactggc 660
tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgc cctgccgaga 720
aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc 780
cattcgacca ccaagcgaaa catcgcatcg agcagcacg tactcggatg gaagccggtc 840
ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg 900
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ccgaagccgc ttggaataag gccgggtgtg gtttgtctat atgttatttt ccaccatatt 1320
gccgtctttt ggcaatgtga gggcccggaa acctggccct gtcttcttga cgagcattcc 1380

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| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|------------|------|
| taggggtctt | tcccctctcg | ccaaaggaat | gcaaggtctg | ttgaatgtcg | tgaaggaagc | 1440 |
| agttcctctg | gaagcttctt | gaagacaaac | aacgtctgta | gcgacccttt | gcaggcagcg | 1500 |
| gaacccccca | cctggcgaca | ggtgcctctg | cggccaaaag | ccacgtgtat | aagatacacc | 1560 |
| tgcaaaggcg | gcacaacccc | agtgccacgt | tgtgagttgg | atagttgtgg | aaagagtcaa | 1620 |
| atggctctcc | tcaagcgtat | tcaacaaggg | gctgaaggat | gcccagaagg | tacccattg | 1680 |
| tatgggatct | gatctggggc | ctcgggtgcac | atgctttaca | tgtgtttagt | cgagggttaa | 1740 |
| aaacgtctag | gcccccgaa | ccacggggac | gtggttttcc | tttgaaaaac | acgataatac | 1800 |
| c atg gac | cgg gag atg | gca gca tgc | tgc gga ggc | gcg gtt ttc | gta ggt | 1849 |
| Met Asp Arg | Glu Met Ala | Ala Ser Cys | Gly Gly Ala | Val Phe Val | Gly | |
| 1 | 5 | 10 | 15 | | | |
| | | | | | | |
| ctg ata ctc | ttg acc ttg | tca ccg cac | tat aag ctg | ttc ctc gct | agg | 1897 |
| Leu Ile Leu | Leu Thr Leu | Ser Pro His | Tyr Lys Leu | Phe Leu Ala | Arg | |
| | 20 | 25 | 30 | | | |
| | | | | | | |
| ctc ata tgg | tgg tta caa | tat ttt atc | acc agg gcc | gag gca cac | ttg | 1945 |
| Leu Ile Trp | Trp Leu Gln | Tyr Phe Ile | Thr Arg Ala | Glu Ala His | Leu | |
| | 35 | 40 | 45 | | | |
| | | | | | | |
| caa gtg tgg | atc ccc ccc | ctc aac gtt | cgg ggg ggc | cgc gat gcc | gtc | 1993 |
| Gln Val Trp | Ile Pro Pro | Leu Asn Val | Arg Gly Gly | Arg Asp Ala | Val | |
| | 50 | 55 | 60 | | | |
| | | | | | | |
| atc ctc ctc | acg tgc gcg | atc cac cca | gag cta atc | ttt acc atc | acc | 2041 |
| Ile Leu Leu | Thr Cys Ala | Ile His Pro | Glu Leu Ile | Phe Thr Ile | Thr | |
| | 65 | 70 | 75 | | 80 | |
| | | | | | | |
| aaa atc ttg | ctc gcc ata | ctc ggt cca | ctc atg gtg | ctc cag gct | ggt | 2089 |
| Lys Ile Leu | Leu Ala Ile | Leu Gly Pro | Leu Met Val | Leu Gln Ala | Gly | |
| | 85 | 90 | 95 | | | |
| | | | | | | |
| ata acc aaa | gtg ccg tac | ttc gtg cgc | gca cac ggg | ctc att cgt | gca | 2137 |
| Ile Thr Lys | Val Pro Tyr | Phe Val Arg | Ala His Gly | Leu Ile Arg | Ala | |
| | 100 | 105 | 110 | | | |
| | | | | | | |
| tgc atg ctg | gtg cgg aag | gtt gct ggg | ggt cat tat | gtc caa atg | gct | 2185 |
| Cys Met Leu | Val Arg Lys | Val Ala Gly | Gly Gly His | Tyr Val Gln | Met Ala | |
| | 115 | 120 | 125 | | | |
| | | | | | | |
| ctc atg aag | ttg gcc gca | ctg aca ggt | acg tac gtt | tat gac cat | ctc | 2233 |
| Leu Met Lys | Leu Ala Ala | Leu Thr Gly | Thr Tyr Val | Tyr Asp His | Leu | |
| | 130 | 135 | 140 | | | |
| | | | | | | |
| acc cca ctg | cgg gac tgg | gcc cac gcg | ggc cta cga | gac ctt gcg | gtg | 2281 |
| Thr Pro Leu | Arg Asp Trp | Ala His Ala | Gly Leu Arg | Asp Leu Ala | Val | |
| | 145 | 150 | 155 | | 160 | |
| | | | | | | |
| gca gtt gag | ccc gtc gtc | ttc tct gat | atg gag acc | aag gtt atc | acc | 2329 |
| Ala Val Glu | Pro Val Val | Phe Ser Asp | Met Glu Thr | Lys Val Ile | Thr | |
| | 165 | 170 | 175 | | | |
| | | | | | | |
| tgg ggg gca | gac acc gcg | gcg tgt ggg | gac atc atc | ttg ggc ctg | ccc | 2377 |
| Trp Gly Ala | Asp Thr Ala | Ala Cys Gly | Asp Ile Ile | Leu Gly Leu | Pro | |
| | 180 | 185 | 190 | | | |

| | |
|---|------|
| gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc | 2425 |
| Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser | |
| 195 200 205 | |
| ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc | 2473 |
| Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser | |
| 210 215 220 | |
| caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc | 2521 |
| Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly | |
| 225 230 235 240 | |
| cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca | 2569 |
| Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala | |
| 245 250 255 | |
| aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc | 2617 |
| Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val | |
| 260 265 270 | |
| tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc | 2665 |
| Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile | |
| 275 280 285 | |
| acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg | 2713 |
| Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala | |
| 290 295 300 | |
| ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac | 2761 |
| Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp | |
| 305 310 315 320 | |
| ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg | 2809 |
| Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg | |
| 325 330 335 | |
| ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg | 2857 |
| Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu | |
| 340 345 350 | |
| aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg | 2905 |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val | |
| 355 360 365 | |
| ggc atc ttt cgg gct gcc gtg tgc acc cgg ggg gtt gcg aag gcg gtg | 2953 |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val | |
| 370 375 380 | |
| gac ttt gta ccc gtc gag tct atg gga acc act atg cgg tcc ccg gtc | 3001 |
| Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val | |
| 385 390 395 400 | |
| ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg | 3049 |
| Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val | |
| 405 410 415 | |

| | |
|---|------|
| gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg | 3097 |
| Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro | |
| 420 425 430 | |
| gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc | 3145 |
| Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser | |
| 435 440 445 | |
| gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt | 3193 |
| Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly | |
| 450 455 460 | |
| atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc | 3241 |
| Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala | |
| 465 470 475 480 | |
| ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc | 3289 |
| Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys | |
| 485 490 495 | |
| tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act | 3337 |
| Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr | |
| 500 505 510 | |
| gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag | 3385 |
| Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu | |
| 515 520 525 | |
| acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga | 3433 |
| Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly | |
| 530 535 540 | |
| tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc | 3481 |
| Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser | |
| 545 550 555 560 | |
| act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc | 3529 |
| Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile | |
| 565 570 575 | |
| aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat | 3577 |
| Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp | |
| 580 585 590 | |
| gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat | 3625 |
| Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr | |
| 595 600 605 | |
| tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att | 3673 |
| Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile | |
| 610 615 620 | |
| gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac | 3721 |
| Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp | |

| 625 | | | | | | 630 | | | | | | 635 | | | | | | 640 | |
|---|--|--|--|---|--|-----|--|--|--|-----|--|-----|--|--|--|---------|------|-----|--|
| tca gtc atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc | | | | | | | | | | | | | | | | | 3769 | | |
| Ser Val Ile Asp | | | | Cys Asn Thr Cys Val Thr Gln Thr Val Asp | | | | | | | | | | | | Phe Ser | | | |
| | | | | 645 | | | | | | 650 | | | | | | 655 | | | |
| ctg gac ccg acc ttc acc att gag acg acc gtc cca caa gac gcg | | | | | | | | | | | | | | | | | 3817 | | |
| Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala | | | | | | | | | | | | | | | | | | | |
| | | | | 660 | | | | | | 665 | | | | | | 670 | | | |
| gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc | | | | | | | | | | | | | | | | | 3865 | | |
| Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly | | | | | | | | | | | | | | | | | | | |
| | | | | 675 | | | | | | 680 | | | | | | 685 | | | |
| att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat | | | | | | | | | | | | | | | | | 3913 | | |
| Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp | | | | | | | | | | | | | | | | | | | |
| | | | | 690 | | | | | | 695 | | | | | | 700 | | | |
| tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag | | | | | | | | | | | | | | | | | 3961 | | |
| Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu | | | | | | | | | | | | | | | | | | | |
| | | | | 705 | | | | | | 710 | | | | | | 715 | 720 | | |
| ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca | | | | | | | | | | | | | | | | | 4009 | | |
| Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr | | | | | | | | | | | | | | | | | | | |
| | | | | 725 | | | | | | 730 | | | | | | 735 | | | |
| cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc | | | | | | | | | | | | | | | | | 4057 | | |
| Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val | | | | | | | | | | | | | | | | | | | |
| | | | | 740 | | | | | | 745 | | | | | | 750 | | | |
| ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag | | | | | | | | | | | | | | | | | 4105 | | |
| Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys | | | | | | | | | | | | | | | | | | | |
| | | | | 755 | | | | | | 760 | | | | | | 765 | | | |
| cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg | | | | | | | | | | | | | | | | | 4153 | | |
| Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val | | | | | | | | | | | | | | | | | | | |
| | | | | 770 | | | | | | 775 | | | | | | 780 | | | |
| tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag | | | | | | | | | | | | | | | | | 4201 | | |
| Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys | | | | | | | | | | | | | | | | | | | |
| | | | | 785 | | | | | | 790 | | | | | | 795 | 800 | | |
| tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg | | | | | | | | | | | | | | | | | 4249 | | |
| Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu | | | | | | | | | | | | | | | | | | | |
| | | | | 805 | | | | | | 810 | | | | | | 815 | | | |
| tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata | | | | | | | | | | | | | | | | | 4297 | | |
| Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile | | | | | | | | | | | | | | | | | | | |
| | | | | 820 | | | | | | 825 | | | | | | 830 | | | |
| acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg | | | | | | | | | | | | | | | | | 4345 | | |
| Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr | | | | | | | | | | | | | | | | | | | |
| | | | | 835 | | | | | | 840 | | | | | | 845 | | | |
| agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat | | | | | | | | | | | | | | | | | 4393 | | |

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|------|------|-----|------|------|-----|------|-----|------|-----|------|------|-----|------|------|------|------|
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | |
| 850 | | | | | | 855 | | | | | 860 | | | | | |
| tgc | ctg | aca | aca | ggc | agc | gtg | gtc | att | gtg | ggc | agg | atc | atc | ttg | tcc | 4441 |
| Cys | Leu | Thr | Thr | Gly | Ser | Val | Val | Ile | Val | Gly | Arg | Ile | Ile | Leu | Ser | |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 | |
| gga | aag | ccg | gcc | atc | att | ccc | gac | agg | gaa | gtc | ctt | tac | cgg | gag | ttc | 4489 |
| Gly | Lys | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Leu | Tyr | Arg | Glu | Phe | |
| | | | | 885 | | | | | 890 | | | | | 895 | | |
| gat | gag | atg | gaa | gag | tgc | gcc | tca | cac | ctc | cct | tac | atc | gaa | cag | gga | 4537 |
| Asp | Glu | Met | | Glu | Cys | Ala | Ser | His | Leu | Pro | Tyr | Ile | Glu | Gln | Gly | |
| | | | 900 | | | | | 905 | | | | | 910 | | | |
| atg | cag | ctc | gcc | gaa | caa | ttc | aaa | cag | aag | gca | atc | ggg | ttg | ctg | caa | 4585 |
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | |
| | | 915 | | | | | 920 | | | | | 925 | | | | |
| aca | gcc | acc | aag | caa | gcg | gag | gct | gct | gct | ccc | gtg | gtg | gaa | tcc | aag | 4633 |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | |
| | 930 | | | | | 935 | | | | | 940 | | | | | |
| tgg | cgg | acc | ctc | gaa | gcc | ttc | tgg | gcg | aag | cat | atg | tgg | aat | ttc | atc | 4681 |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | |
| 945 | | | | 950 | | | | | | 955 | | | | | 960 | |
| agc | ggg | ata | caa | tat | tta | gca | ggc | ttg | tcc | act | ctg | cct | ggc | aac | ccc | 4729 |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | |
| | | | | 965 | | | | 970 | | | | | | 975 | | |
| gcg | ata | gca | tca | ctg | atg | gca | ttc | aca | gcc | tct | atc | acc | agc | ccg | ctc | 4777 |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | |
| | | | 980 | | | | | 985 | | | | | 990 | | | |
| acc | acc | caa | cat | acc | ctc | ctg | ttt | aac | atc | ctg | ggg | gga | tgg | gtg | gcc | 4825 |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | |
| | | 995 | | | | 1000 | | | | | 1005 | | | | | |
| gcc | caa | ctt | gct | cct | ccc | agc | gct | gct | tct | gct | ttc | gta | ggc | gcc | ggc | 4873 |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | |
| 1025 | | | | 1030 | | | | | | 1035 | | | | | 1040 | |
| gat | att | ttg | gca | ggt | tat | gga | gca | ggg | gtg | gca | ggc | gcg | ctc | gtg | gcc | 4969 |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | |
| | | | | 1045 | | | | 1050 | | | | | | 1055 | | |
| ttt | aag | gtc | atg | agc | ggc | gag | atg | ccc | tcc | acc | gag | gac | ctg | gtt | aac | 5017 |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | |
| | | | 1060 | | | | | 1065 | | | | | 1070 | | | |

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|---|------|
| cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg | 5065 |
| Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val | |
| 1075 1080 1085 | |
| tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg | 5113 |
| Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val | |
| 1090 1095 1100 | |
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | |
| 1105 1110 1115 1120 | |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | |
| 1125 1130 1135 | |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg gta tgc acg gtg ttg act gat ttc aag acc | 5353 |
| Arg Asp Val Trp Asp Trp Val Cys Thr Val Leu Thr Asp Phe Lys Thr | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |

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|---|------|
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca | 5881 |
| Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg ccc tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |

| 1505 | 1510 | 1515 | 1520 | |
|---|------|------|-----------|------|
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | | | | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | 1525 | 1530 | 1535 | |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | | | | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | 1540 | 1545 | 1550 | |
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | | | | 6505 |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | 1555 | 1560 | 1565 | |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg | | | | 6553 |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | 1570 | 1575 | 1580 | |
| gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc | | | | 6601 |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser | 1585 | 1590 | 1595 1600 | |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg | | | | 6649 |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | 1605 | 1610 | 1615 | |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | | | | 6697 |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | 1620 | 1625 | 1630 | |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat | | | | 6745 |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | 1635 | 1640 | 1645 | |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | | | | 6793 |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | 1650 | 1655 | 1660 | |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag | | | | 6841 |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | 1665 | 1670 | 1675 1680 | |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | | | | 6889 |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | 1685 | 1690 | 1695 | |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | | | | 6937 |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | 1700 | 1705 | 1710 | |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | | | | 6985 |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | 1715 | 1720 | 1725 | |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | | | | 7033 |

| | |
|---|---------------------|
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | |
| 1730 | 1735 1740 |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | |
| 1745 | 1750 1755 1760 |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 |
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| | 1765 1770 1775 |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| | 1780 1785 1790 |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| | 1795 1800 1805 |
| cag cgg gtc gag ttc ctg gtg aat gct tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| | 1810 1815 1820 |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| | 1825 1830 1835 1840 |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| | 1845 1850 1855 |
| ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| | 1860 1865 1870 |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| | 1875 1880 1885 |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| | 1890 1895 1900 |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| | 1905 1910 1915 1920 |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| | 1925 1930 1935 |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| | 1940 1945 1950 |

| | |
|---|------|
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 1960 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 1975 1980 | |
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 1990 1995 2000 | |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 2010 2015 | |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg | 8281 |
| Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp | |
| 2145 2150 2155 2160 | |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt | 8329 |
| Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg | |
| 2165 2170 2175 | |

gcc cga ccc cgc tgg ttc acg tgg tgc cta ctc cta ctt tct gta ggg 8377
 Ala Arg Pro Arg Trp Phe Thr Trp Cys Leu Leu Leu Leu Ser Val Gly
 2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427
 Val Gly Ile Tyr Leu Leu Pro Asn Arg *
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| Met | Asp | Arg | Glu | Met | Ala | Ala | Ser | Cys | Gly | Gly | Ala | Val | Phe | Val | Gly | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| ctg | ata | ctc | ttg | acc | ttg | tca | ccg | cac | tat | aag | ctg | ttc | ctc | gct | agg | 1897 |
| Leu | Ile | Leu | Leu | Thr | Leu | Ser | Pro | His | Tyr | Lys | Leu | Phe | Leu | Ala | Arg | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| ctc | ata | tgg | tgg | tta | caa | tat | ttt | atc | acc | agg | gcc | gag | gca | cac | ttg | 1945 |
| Leu | Ile | Trp | Trp | Leu | Gln | Tyr | Phe | Ile | Thr | Arg | Ala | Glu | Ala | His | Leu | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| caa | gtg | tgg | atc | ccc | ccc | ctc | aac | gtt | cgg | ggg | ggc | cgc | gat | gcc | gtc | 1993 |
| Gln | Val | Trp | Ile | Pro | Pro | Leu | Asn | Val | Arg | Gly | Gly | Arg | Asp | Ala | Val | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| atc | ctc | ctc | acg | tgc | gcg | atc | cac | cca | gag | cta | atc | ttt | acc | atc | acc | 2041 |
| Ile | Leu | Leu | Thr | Cys | Ala | Ile | His | Pro | Glu | Leu | Ile | Phe | Thr | Ile | Thr | |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| aaa | atc | ttg | ctc | gcc | ata | ctc | ggt | cca | ctc | atg | gtg | ctc | cag | gct | ggt | 2089 |
| Lys | Ile | Leu | Leu | Ala | Ile | Leu | Gly | Pro | Leu | Met | Val | Leu | Gln | Ala | Gly | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| ata | acc | aaa | gtg | ccg | tac | ttc | gtg | cgc | gca | cac | ggg | ctc | att | cgt | gca | 2137 |
| Ile | Thr | Lys | Val | Pro | Tyr | Phe | Val | Arg | Ala | His | Gly | Leu | Ile | Arg | Ala | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| tgc | atg | ctg | gtg | cgg | aag | gtt | gct | ggg | ggt | cat | tat | gtc | caa | atg | gct | 2185 |
| Cys | Met | Leu | Val | Arg | Lys | Val | Ala | Gly | Gly | His | Tyr | Val | Gln | Met | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| ctc | atg | aag | ttg | gcc | gca | ctg | aca | ggt | acg | tac | gtt | tat | gac | cat | ctc | 2233 |
| Leu | Met | Lys | Leu | Ala | Ala | Leu | Thr | Gly | Thr | Tyr | Val | Tyr | Asp | His | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| acc | cca | ctg | cgg | gac | tgg | gcc | cac | gcg | ggc | cta | cga | gac | ctt | gcg | gtg | 2281 |
| Thr | Pro | Leu | Arg | Asp | Trp | Ala | His | Ala | Gly | Leu | Arg | Asp | Leu | Ala | Val | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| gca | gtt | gag | ccc | gtc | gtc | ttc | tct | gat | atg | gag | acc | aag | gtt | atc | acc | 2329 |
| Ala | Val | Glu | Pro | Val | Val | Phe | Ser | Asp | Met | Glu | Thr | Lys | Val | Ile | Thr | |
| | | | 165 | | | | | | 170 | | | | | 175 | | |
| tgg | ggg | gca | gac | acc | gcg | gcg | tgt | ggg | gac | atc | atc | ttg | ggc | ctg | ccc | 2377 |
| Trp | Gly | Ala | Asp | Thr | Ala | Ala | Cys | Gly | Asp | Ile | Ile | Leu | Gly | Leu | Pro | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| gtc | tcc | gcc | cgc | agg | ggg | agg | gag | ata | cat | ctg | gga | ccg | gca | gac | agc | 2425 |
| Val | Ser | Ala | Arg | Arg | Gly | Arg | Glu | Ile | His | Leu | Gly | Pro | Ala | Asp | Ser | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| ctt | gaa | ggg | cag | ggg | tgg | cga | ctc | ctc | gcg | cct | att | acg | gcc | tac | tcc | 2473 |
| Leu | Glu | Gly | Gln | Gly | Trp | Arg | Leu | Leu | Ala | Pro | Ile | Thr | Ala | Tyr | Ser | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |

| | |
|---|------|
| caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc | 2521 |
| Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly | |
| 225 230 235 240 | |
| cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca | 2569 |
| Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala | |
| 245 250 255 | |
| aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc | 2617 |
| Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val | |
| 260 265 270 | |
| tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc | 2665 |
| Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile | |
| 275 280 285 | |
| acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg | 2713 |
| Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala | |
| 290 295 300 | |
| ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac | 2761 |
| Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp | |
| 305 310 315 320 | |
| ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg | 2809 |
| Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg | |
| 325 330 335 | |
| ggc gac ggc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg | 2857 |
| Gly Asp Gly Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu | |
| 340 345 350 | |
| aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg | 2905 |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val | |
| 355 360 365 | |
| ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg | 2953 |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val | |
| 370 375 380 | |
| gac ttt gta ccc gtc gag tct atg gga acc act atg cgg tcc ccg gtc | 3001 |
| Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val | |
| 385 390 395 400 | |
| ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg | 3049 |
| Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val | |
| 405 410 415 | |
| gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg | 3097 |
| Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro | |
| 420 425 430 | |
| gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc | 3145 |
| Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser | |
| 435 440 445 | |

| | |
|---|------|
| gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt | 3193 |
| Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly | |
| 450 455 460 | |
| atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc | 3241 |
| Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala | |
| 465 470 475 480 | |
| ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc | 3289 |
| Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys | |
| 485 490 495 | |
| tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act | 3337 |
| Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr | |
| 500 505 510 | |
| gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag | 3385 |
| Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu | |
| 515 520 525 | |
| acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga | 3433 |
| Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly | |
| 530 535 540 | |
| tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc | 3481 |
| Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser | |
| 545 550 555 560 | |
| act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc | 3529 |
| Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile | |
| 565 570 575 | |
| aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat | 3577 |
| Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp | |
| 580 585 590 | |
| gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat | 3625 |
| Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr | |
| 595 600 605 | |
| tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att | 3673 |
| Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile | |
| 610 615 620 | |
| gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac | 3721 |
| Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp | |
| 625 630 635 640 | |
| tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc | 3769 |
| Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser | |
| 645 650 655 | |
| ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg | 3817 |
| Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala | |

| 660 | | | | | | | | 665 | | | | 670 | | | | | | |
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| gtg | tca | cgc | tgc | cag | cgg | cga | ggc | agg | act | ggg | agg | ggc | agg | atg | ggc | 3865 | | |
| Val | Ser | Arg | Ser | Gln | Arg | Arg | Gly | Arg | Thr | Gly | Arg | Gly | Arg | Met | Gly | | | |
| | | 675 | | | | | 680 | | | | | 685 | | | | | | |
| att | tac | agg | ttt | gtg | act | cca | gga | gaa | cgg | ccc | tgc | ggc | atg | ttc | gat | 3913 | | |
| Ile | Tyr | Arg | Phe | Val | Thr | Pro | Gly | Glu | Arg | Pro | Ser | Gly | Met | Phe | Asp | | | |
| | 690 | | | | | 695 | | | | 700 | | | | | | | | |
| tcc | tgc | gtt | ctg | tgc | gag | tgc | tat | gac | gcg | ggc | tgt | gct | tgg | tac | gag | 3961 | | |
| Ser | Ser | Val | Leu | Cys | Glu | Cys | Tyr | Asp | Ala | Gly | Cys | Ala | Trp | Tyr | Glu | | | |
| 705 | | | | 710 | | | | | 715 | | | | | | 720 | | | |
| ctc | acg | ccc | gcc | gag | acc | tca | gtt | agg | ttg | cgg | gct | tac | cta | aac | aca | 4009 | | |
| Leu | Thr | Pro | Ala | Glu | Thr | Ser | Val | Arg | Leu | Arg | Ala | Tyr | Leu | Asn | Thr | | | |
| | | | | 725 | | | | | 730 | | | | | 735 | | | | |
| cca | ggg | ttg | ccc | gtc | tgc | cag | gac | cat | ctg | gag | ttc | tgg | gag | agc | gtc | 4057 | | |
| Pro | Gly | Leu | Pro | Val | Cys | Gln | Asp | His | Leu | Glu | Phe | Trp | Glu | Ser | Val | | | |
| | | | 740 | | | | | 745 | | | | | 750 | | | | | |
| ttt | aca | ggc | ctc | acc | cac | ata | gac | gcc | cat | ttc | ttg | tcc | cag | act | aag | 4105 | | |
| Phe | Thr | Gly | Leu | Thr | His | Ile | Asp | Ala | His | Phe | Leu | Ser | Gln | Thr | Lys | | | |
| | | 755 | | | | | 760 | | | | | 765 | | | | | | |
| cag | gca | gga | gac | aac | ttc | ccc | tac | ctg | gta | gca | tac | cag | gct | acg | gtg | 4153 | | |
| Gln | Ala | Gly | Asp | Asn | Phe | Pro | Tyr | Leu | Val | Ala | Tyr | Gln | Ala | Thr | Val | | | |
| | 770 | | | | | 775 | | | | | 780 | | | | | | | |
| tgc | gcc | agg | gct | cag | gct | cca | cct | cca | tgc | tgg | gac | caa | atg | tgg | aag | 4201 | | |
| Cys | Ala | Arg | Ala | Gln | Ala | Pro | Pro | Pro | Ser | Trp | Asp | Gln | Met | Trp | Lys | | | |
| 785 | | | | 790 | | | | | 795 | | | | | | 800 | | | |
| tgt | ctc | ata | cgg | cta | aag | cct | acg | ctg | cac | ggg | cca | acg | ccc | ctg | ctg | 4249 | | |
| Cys | Leu | Ile | Arg | Leu | Lys | Pro | Thr | Leu | His | Gly | Pro | Thr | Pro | Leu | Leu | | | |
| | | | | 805 | | | | | 810 | | | | | 815 | | | | |
| tat | agg | ctg | gga | gcc | gtt | caa | aac | gag | gtt | act | acc | aca | cac | ccc | ata | 4297 | | |
| Tyr | Arg | Leu | Gly | Ala | Val | Gln | Asn | Glu | Val | Thr | Thr | Thr | His | Pro | Ile | | | |
| | | | 820 | | | | | 825 | | | | | 830 | | | | | |
| acc | aaa | tac | atc | atg | gca | tgc | atg | tgc | gct | gac | ctg | gag | gtc | gtc | acg | 4345 | | |
| Thr | Lys | Tyr | Ile | Met | Ala | Cys | Met | Ser | Ala | Asp | Leu | Glu | Val | Val | Thr | | | |
| | | 835 | | | | | 840 | | | | | 845 | | | | | | |
| agc | acc | tgg | gtg | ctg | gta | ggc | gga | gtc | cta | gca | gct | ctg | gcc | gcg | tat | 4393 | | |
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | | | |
| | | 850 | | | | 855 | | | | | 860 | | | | | | | |
| tgc | ctg | aca | aca | ggc | agc | gtg | gtc | att | gtg | ggc | agg | atc | atc | ttg | tcc | 4441 | | |
| Cys | Leu | Thr | Thr | Gly | Ser | Val | Val | Ile | Val | Gly | Arg | Ile | Ile | Leu | Ser | | | |
| 865 | | | | 870 | | | | | | 875 | | | | | 880 | | | |
| gga | aag | ccg | gcc | atc | att | ccc | gac | agg | gaa | gtc | ttt | tac | cgg | gag | ttc | 4489 | | |

| | | | | | | | | | | | | | | | | | |
|-----|------|------|------|-----|------|------|------|------|------|-----|------|------|------|------|------|------|--|
| Gly | Lys | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Phe | Tyr | Arg | Glu | Phe | | |
| | | | | 885 | | | | | 890 | | | | | 895 | | | |
| gat | gag | atg | gaa | gag | tgc | gcc | tca | cac | ctc | cct | tac | atc | gaa | cag | gga | 4537 | |
| Asp | Glu | Met | Glu | Glu | Cys | Ala | Ser | His | Leu | Pro | Tyr | Ile | Glu | Gln | Gly | | |
| | | | 900 | | | | | 905 | | | | | 910 | | | | |
| atg | cag | ctc | gcc | gaa | caa | ttc | aaa | cag | aag | gca | atc | ggg | ttg | ctg | caa | 4585 | |
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | | |
| | | 915 | | | | | 920 | | | | | 925 | | | | | |
| aca | gcc | acc | aag | caa | gcg | gag | gct | gct | gct | ccc | gtg | gtg | gaa | tcc | aag | 4633 | |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | | |
| | 930 | | | | | | 935 | | | | 940 | | | | | | |
| tgg | cgg | acc | ctc | gaa | gcc | ttc | tgg | gcg | aag | cat | atg | tgg | aat | ttc | atc | 4681 | |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | | |
| | 945 | | | | 950 | | | | | 955 | | | | | 960 | | |
| agc | ggg | ata | caa | tat | tta | gca | ggc | ttg | tcc | act | ctg | cct | ggc | aac | ccc | 4729 | |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | | |
| | | | 965 | | | | | | 970 | | | | | 975 | | | |
| gcg | ata | gca | tca | ctg | atg | gca | ttc | aca | gcc | tct | atc | acc | agc | ccg | ctc | 4777 | |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | | |
| | | | 980 | | | | | 985 | | | | | 990 | | | | |
| acc | acc | caa | cat | acc | ctc | ctg | ttt | aac | atc | ctg | ggg | gga | tgg | gtg | gcc | 4825 | |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | | |
| gcc | caa | ctt | gct | cct | ccc | agc | gct | gct | tct | gct | ttc | gta | ggc | gcc | ggc | 4873 | |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 | |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | | |
| | 1025 | | | | 1030 | | | | 1035 | | | | | | 1040 | | |
| gat | att | ttg | gca | ggt | tat | gga | gca | ggg | gtg | gca | ggc | gcg | ctc | gtg | gcc | 4969 | |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | | |
| | | | 1045 | | | | | 1050 | | | | | | 1055 | | | |
| ttt | aag | gtc | atg | agc | ggc | gag | atg | ccc | tcc | acc | gag | gac | ctg | gtt | aac | 5017 | |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | | |
| | | 1060 | | | | | | 1065 | | | | | 1070 | | | | |
| cta | ctc | cct | gct | atc | ctc | tcc | cct | ggc | gcc | cta | gtc | gtc | ggg | gtc | gtg | 5065 | |
| Leu | Leu | Pro | Ala | Ile | Leu | Ser | Pro | Gly | Ala | Leu | Val | Val | Gly | Val | Val | | |
| | | 1075 | | | | | 1080 | | | | | 1085 | | | | | |
| tgc | gca | gcg | ata | ctg | cgt | cgg | cac | gtg | ggc | cca | ggg | gag | ggg | gct | gtg | 5113 | |
| Cys | Ala | Ala | Ile | Leu | Arg | Arg | His | Val | Gly | Pro | Gly | Glu | Gly | Ala | Val | | |
| | 1090 | | | | | 1095 | | | | | 1100 | | | | | | |

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|---|------|
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | |
| 1105 1110 1115 1120 | |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | |
| 1125 1130 1135 | |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| cgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Arg Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |

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|---|------|
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca | 5881 |
| Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 1445 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ctg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |
| 1505 1510 1515 1520 | |
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | |
| 1525 1530 1535 | |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | |

| 1540 | | | | | 1545 | | | | | 1550 | | | | | |
|---|------|--|--|--|------|--|--|--|--|------|--|--|--|--|--|
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | 6505 | | | | | | | | | | | | | | |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | | | | | | | | | | | | | | | |
| 1555 1560 1565 | | | | | | | | | | | | | | | |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg | 6553 | | | | | | | | | | | | | | |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | | | | | | | | | | | | | | | |
| 1570 1575 1580 | | | | | | | | | | | | | | | |
| gag ccg ggg gat ccc gat ctc agc gac ggg cct tgg tct acc gta agc | 6601 | | | | | | | | | | | | | | |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Pro Trp Ser Thr Val Ser | | | | | | | | | | | | | | | |
| 1585 1590 1595 1600 | | | | | | | | | | | | | | | |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg | 6649 | | | | | | | | | | | | | | |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | | | | | | | | | | | | | | | |
| 1605 1610 1615 | | | | | | | | | | | | | | | |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | 6697 | | | | | | | | | | | | | | |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | | | | | | | | | | | | | | | |
| 1620 1625 1630 | | | | | | | | | | | | | | | |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat | 6745 | | | | | | | | | | | | | | |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | | | | | | | | | | | | | | | |
| 1635 1640 1645 | | | | | | | | | | | | | | | |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | 6793 | | | | | | | | | | | | | | |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | | | | | | | | | | | | | | | |
| 1650 1655 1660 | | | | | | | | | | | | | | | |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag | 6841 | | | | | | | | | | | | | | |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | | | | | | | | | | | | | | | |
| 1665 1670 1675 1680 | | | | | | | | | | | | | | | |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | 6889 | | | | | | | | | | | | | | |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | | | | | | | | | | | | | | | |
| 1685 1690 1695 | | | | | | | | | | | | | | | |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | 6937 | | | | | | | | | | | | | | |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | | | | | | | | | | | | | | | |
| 1700 1705 1710 | | | | | | | | | | | | | | | |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | 6985 | | | | | | | | | | | | | | |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | | | | | | | | | | | | | | | |
| 1715 1720 1725 | | | | | | | | | | | | | | | |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | 7033 | | | | | | | | | | | | | | |
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | | | | | | | | | | | | | | | |
| 1730 1735 1740 | | | | | | | | | | | | | | | |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 | | | | | | | | | | | | | | |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | | | | | | | | | | | | | | | |
| 1745 1750 1755 1760 | | | | | | | | | | | | | | | |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 | | | | | | | | | | | | | | |

| | |
|---|------|
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| 1765 1770 1775 | |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| 1780 1785 1790 | |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 1800 1805 | |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 1815 1820 | |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 1830 1835 1840 | |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 1850 1855 | |
| ccc gaa gcc aga cag gcc ata agg tgc ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 1865 1870 | |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 1880 1885 | |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 1895 1900 | |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 1910 1915 1920 | |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 1930 1935 | |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 1945 1950 | |
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 1960 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 1975 1980 | |

| | |
|---|------|
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 1990 1995 2000 | |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 2010 2015 | |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg | 8281 |
| Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp | |
| 2145 2150 2155 2160 | |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt | 8329 |
| Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg | |
| 2165 2170 2175 | |
| gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg | 8377 |
| Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly | |
| 2180 2185 2190 | |
| gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca | 8427 |
| Val Gly Ile Tyr Leu Leu Pro Asn Arg * | |
| 2195 2200 | |

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ggccaatagg ccatacctggt tttttttttt tttttttttt tttttttttt tttttttttt 8487
tttttttttt tttttttttt ttttttcttc ttttttttcc ttttctttcc tttgggtggct 8547
ccatcttagc cctagtcacg gctagctgtg aaagggtccgt gagccgcttg actgcagaga 8607
gtgctgatac tggcctctct gcagatcaag t 8638

```

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<210> 7
<211> 8638
<212> DNA
<213> HCV

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<220>
<221> CDS
<222> (1802) ... (8407)

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gacgaccggg tcctttcttg gatcaaccgg ctcaatgcct ggagatttgg gcgtgcccc 240
gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtgggtact gcctgatagg 300
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cgacgggcgt tccttgccga gctgtgctcg acgttgtcac tgaagcggga agggactggc 660
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tatgggatct gatctggggc ctcggtgcac atgctttaca tgtgtttagt cgagggttaa 1740
aaacgtctag gccccccgaa ccacggggac gtggttttcc tttgaaaaac acgataatac 1800
c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
1 5 10 15

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ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
20 25 30

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ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Leu | Ile | Trp | Trp | Leu | Gln | Tyr | Phe | Ile | Thr | Arg | Ala | Glu | Ala | His | Leu | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| caa | gtg | tgg | atc | ccc | ccc | ctc | aac | gtt | cgg | ggg | ggc | cgc | gat | gcc | gtc | 1993 |
| Gln | Val | Trp | Ile | Pro | Pro | Leu | Asn | Val | Arg | Gly | Gly | Arg | Asp | Ala | Val | |
| | 50 | | | | | 55 | | | | 60 | | | | | | |
| atc | ctc | ctc | acg | tgc | gcg | atc | cac | cca | gag | cta | atc | ttt | acc | atc | acc | 2041 |
| Ile | Leu | Leu | Thr | Cys | Ala | Ile | His | Pro | Glu | Leu | Ile | Phe | Thr | Ile | Thr | |
| | 65 | | | | 70 | | | | 75 | | | | | | 80 | |
| aaa | atc | ttg | ctc | gcc | ata | ctc | ggg | cca | ctc | atg | gtg | ctc | cag | gct | ggg | 2089 |
| Lys | Ile | Leu | Leu | Ala | Ile | Leu | Gly | Pro | Leu | Met | Val | Leu | Gln | Ala | Gly | |
| | | | | 85 | | | | 90 | | | | | | 95 | | |
| ata | acc | aaa | gtg | ccg | tac | ttc | gtg | cgc | gca | cac | ggg | ctc | att | cgt | gca | 2137 |
| Ile | Thr | Lys | Val | Pro | Tyr | Phe | Val | Arg | Ala | His | Gly | Leu | Ile | Arg | Ala | |
| | | 100 | | | | | 105 | | | | | | 110 | | | |
| tgc | atg | ctg | gtg | cgg | aag | gtt | gct | ggg | ggg | cat | tat | gtc | caa | atg | gct | 2185 |
| Cys | Met | Leu | Val | Arg | Lys | Val | Ala | Gly | Gly | His | Tyr | Val | Gln | Met | Ala | |
| | | 115 | | | | 120 | | | | | | 125 | | | | |
| ctc | atg | aag | ttg | gcc | gca | ctg | aca | ggg | acg | tac | gtt | tat | gac | cat | ctc | 2233 |
| Leu | Met | Lys | Leu | Ala | Ala | Leu | Thr | Gly | Thr | Tyr | Val | Tyr | Asp | His | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| acc | cca | ctg | cgg | gac | tgg | gcc | cac | gcg | ggc | cta | cga | gac | ctt | gcg | gtg | 2281 |
| Thr | Pro | Leu | Arg | Asp | Trp | Ala | His | Ala | Gly | Leu | Arg | Asp | Leu | Ala | Val | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| gca | gtt | gag | ccc | gtc | gtc | ttc | tct | gat | atg | gag | acc | aag | gtt | atc | acc | 2329 |
| Ala | Val | Glu | Pro | Val | Val | Phe | Ser | Asp | Met | Glu | Thr | Lys | Val | Ile | Thr | |
| | | | 165 | | | | | 170 | | | | | | 175 | | |
| tgg | ggg | gca | gac | acc | gcg | gcg | tgt | ggg | gac | atc | atc | ttg | ggc | ctg | ccc | 2377 |
| Trp | Gly | Ala | Asp | Thr | Ala | Ala | Cys | Gly | Asp | Ile | Ile | Leu | Gly | Leu | Pro | |
| | | | 180 | | | | 185 | | | | | | 190 | | | |
| gtc | tcc | gcc | cgc | agg | ggg | agg | gag | ata | cat | ctg | gga | ccg | gca | gac | agc | 2425 |
| Val | Ser | Ala | Arg | Arg | Gly | Arg | Glu | Ile | His | Leu | Gly | Pro | Ala | Asp | Ser | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| ctt | gaa | ggg | cag | ggg | tgg | cga | ctc | ctc | gcg | cct | att | acg | gcc | tac | tcc | 2473 |
| Leu | Glu | Gly | Gln | Gly | Trp | Arg | Leu | Leu | Ala | Pro | Ile | Thr | Ala | Tyr | Ser | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| caa | cag | acg | cga | ggc | cta | ctt | ggc | tgc | atc | atc | acc | agc | ctc | aca | ggc | 2521 |
| Gln | Gln | Thr | Arg | Gly | Leu | Leu | Gly | Cys | Ile | Ile | Thr | Ser | Leu | Thr | Gly | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | |
| cgg | gac | agg | aac | cag | gtc | gag | ggg | gag | gtc | caa | gtg | gtc | tcc | acc | gca | 2569 |
| Arg | Asp | Arg | Asn | Gln | Val | Glu | Gly | Glu | Val | Gln | Val | Val | Ser | Thr | Ala | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| aca | caa | tct | ttc | ctg | gcg | acc | tgc | gtc | aat | ggc | gtg | tgt | tgg | act | gtc | 2617 |
| Thr | Gln | Ser | Phe | Leu | Ala | Thr | Cys | Val | Asn | Gly | Val | Cys | Trp | Thr | Val | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| tat | cat | ggg | gcc | ggc | tca | aag | acc | ctt | gcc | ggc | cca | aag | ggc | cca | atc | 2665 |
| Tyr | His | Gly | Ala | Gly | Ser | Lys | Thr | Leu | Ala | Gly | Pro | Lys | Gly | Pro | Ile | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| acc | caa | atg | tac | acc | aat | gtg | gac | cag | gac | ctc | gtc | ggc | tgg | caa | gcg | 2713 |
| Thr | Gln | Met | Tyr | Thr | Asn | Val | Asp | Gln | Asp | Leu | Val | Gly | Trp | Gln | Ala | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| ccc | ccc | ggg | gcg | cgt | tcc | ttg | aca | cca | tgc | acc | tgc | ggc | agc | tcg | gac | 2761 |
| Pro | Pro | Gly | Ala | Arg | Ser | Leu | Thr | Pro | Cys | Thr | Cys | Gly | Ser | Ser | Asp | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| ctt | tac | ttg | gtc | acg | aag | cat | gcc | gat | gtc | att | ccg | gtg | cgc | cgg | cgg | 2809 |
| Leu | Tyr | Leu | Val | Thr | Lys | His | Ala | Asp | Val | Ile | Pro | Val | Arg | Arg | Arg | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| ggc | gac | agc | agg | ggg | agc | cta | ctc | tcc | ccc | cgg | ccc | gtc | tcc | tac | ttg | 2857 |
| Gly | Asp | Ser | Arg | Gly | Ser | Leu | Leu | Ser | Pro | Arg | Pro | Val | Ser | Tyr | Leu | |
| | | | 340 | | | | | 345 | | | | | 350 | | | |
| aag | ggc | tct | tcg | ggc | ggg | cca | ctg | ctc | tgc | ccc | tcg | ggg | cac | gct | gtg | 2905 |
| Lys | Gly | Ser | Ser | Gly | Gly | Pro | Leu | Leu | Cys | Pro | Ser | Gly | His | Ala | Val | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |
| ggc | atc | ttt | cgg | gct | gcc | gtg | tgc | acc | cga | ggg | gtt | gcg | aag | gcg | gtg | 2953 |
| Gly | Ile | Phe | Arg | Ala | Ala | Val | Cys | Thr | Arg | Gly | Val | Ala | Lys | Ala | Val | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |
| gac | ttt | gta | ccc | gtc | gag | tct | atg | gaa | acc | act | atg | cgg | tcc | ccg | gtc | 3001 |
| Asp | Phe | Val | Pro | Val | Glu | Ser | Met | Glu | Thr | Thr | Met | Arg | Ser | Pro | Val | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | |
| ttc | acg | gac | aac | tcg | tcc | cct | ccg | gcc | gta | ccg | cag | aca | ttc | cag | gtg | 3049 |
| Phe | Thr | Asp | Asn | Ser | Ser | Pro | Pro | Ala | Val | Pro | Gln | Thr | Phe | Gln | Val | |
| | | | 405 | | | | | 410 | | | | | 415 | | | |
| gcc | cat | cta | cac | gcc | cct | act | ggg | agc | ggc | aag | agc | act | aag | gtg | ccg | 3097 |
| Ala | His | Leu | His | Ala | Pro | Thr | Gly | Ser | Gly | Lys | Ser | Thr | Lys | Val | Pro | |
| | | | 420 | | | | 425 | | | | | | 430 | | | |
| gct | gcg | tat | gca | gcc | caa | ggg | tat | aag | gtg | ctt | gtc | ctg | aac | ccg | tcc | 3145 |
| Ala | Ala | Tyr | Ala | Ala | Gln | Gly | Tyr | Lys | Val | Leu | Val | Leu | Asn | Pro | Ser | |
| | | 435 | | | | 440 | | | | | | 445 | | | | |
| gtc | gcc | gcc | acc | cta | ggg | ttc | ggg | gcg | tat | atg | tct | aag | gca | cat | ggg | 3193 |
| Val | Ala | Ala | Thr | Leu | Gly | Phe | Gly | Ala | Tyr | Met | Ser | Lys | Ala | His | Gly | |
| | 450 | | | | 455 | | | | | 460 | | | | | | |
| atc | gac | cct | aac | atc | aga | acc | ggg | gta | agg | acc | atc | acc | acg | ggg | gcc | 3241 |
| Ile | Asp | Pro | Asn | Ile | Arg | Thr | Gly | Val | Arg | Thr | Ile | Thr | Thr | Gly | Ala | |
| 465 | | | | | 470 | | | | 475 | | | | | | 480 | |

| | |
|---|------|
| ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc | 3289 |
| Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys | |
| 485 490 495 | |
| tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act | 3337 |
| Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr | |
| 500 505 510 | |
| gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag | 3385 |
| Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu | |
| 515 520 525 | |
| acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga | 3433 |
| Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly | |
| 530 535 540 | |
| tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc | 3481 |
| Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser | |
| 545 550 555 560 | |
| act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc | 3529 |
| Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile | |
| 565 570 575 | |
| aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat | 3577 |
| Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp | |
| 580 585 590 | |
| gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat | 3625 |
| Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr | |
| 595 600 605 | |
| tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att | 3673 |
| Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile | |
| 610 615 620 | |
| gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac | 3721 |
| Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp | |
| 625 630 635 640 | |
| tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc | 3769 |
| Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser | |
| 645 650 655 | |
| ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg | 3817 |
| Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala | |
| 660 665 670 | |
| gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc | 3865 |
| Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly | |
| 675 680 685 | |
| att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat | 3913 |
| Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp | |

| 690 | 695 | 700 | |
|---|-----|-----|------|
| tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720 | | | 3961 |
| ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735 | | | 4009 |
| cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val 740 745 750 | | | 4057 |
| ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765 | | | 4105 |
| cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780 | | | 4153 |
| tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800 | | | 4201 |
| tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815 | | | 4249 |
| tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile 820 825 830 | | | 4297 |
| acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845 | | | 4345 |
| agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gct gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860 | | | 4393 |
| tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865 870 875 880 | | | 4441 |
| gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe 885 890 895 | | | 4489 |
| gat gag atg gaa gag tgt gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900 905 910 | | | 4537 |
| atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa | | | 4585 |

| | | | | | | | | | | | | | | | | |
|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | |
| | | 915 | | | | | 920 | | | | | 925 | | | | |
| aca | gcc | acc | aag | caa | gcg | gag | gct | gct | gct | ccc | gtg | gtg | gaa | tcc | aag | 4633 |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | |
| | | 930 | | | | 935 | | | | | 940 | | | | | |
| tgg | cgg | acc | ctc | gaa | gcc | ttc | tgg | gcg | aag | cat | atg | tgg | aat | ttc | atc | 4681 |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | |
| | | 945 | | | 950 | | | | | 955 | | | | | 960 | |
| agc | ggg | ata | caa | tat | tta | gca | ggc | ttg | tcc | act | ctg | cct | ggc | aac | ccc | 4729 |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | |
| | | | | 965 | | | | | 970 | | | | | 975 | | |
| gcg | ata | gca | tca | ctg | atg | gca | ttc | aca | gcc | tct | atc | acc | agc | ccg | ctc | 4777 |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | |
| | | | 980 | | | | | 985 | | | | | 990 | | | |
| acc | acc | caa | cat | acc | ctc | ctg | ttt | aac | atc | ctg | ggg | gga | tgg | gtg | gcc | 4825 |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | |
| gcc | caa | ctt | gct | cct | ccc | agc | gct | gct | tcc | gct | ttc | gta | ggc | gcc | ggc | 4873 |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | |
| | | 1010 | | | | 1015 | | | | | 1020 | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | |
| | | 1025 | | | 1030 | | | | | 1035 | | | | | 1040 | |
| gat | att | ttg | gca | ggc | tat | gga | gca | ggg | gtg | gca | ggc | gcg | ctc | gtg | gcc | 4969 |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | |
| | | | | 1045 | | | | | 1050 | | | | | 1055 | | |
| ttt | aag | gtc | atg | agc | ggc | gag | atg | ccc | tcc | acc | gag | gac | ctg | gtt | aac | 5017 |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | |
| | | | 1060 | | | | | 1065 | | | | | 1070 | | | |
| cta | ctc | cct | gct | atc | ctc | tcc | cct | ggc | gcc | cta | gtc | gtc | ggg | gtc | gtg | 5065 |
| Leu | Leu | Pro | Ala | Ile | Leu | Ser | Pro | Gly | Ala | Leu | Val | Val | Gly | Val | Val | |
| | | 1075 | | | | | 1080 | | | | | 1085 | | | | |
| tgc | gca | gcg | ata | ctg | cgt | cgg | cac | gtg | ggc | cca | ggg | gag | ggg | gct | gtg | 5113 |
| Cys | Ala | Ala | Ile | Leu | Arg | Arg | His | Val | Gly | Pro | Gly | Glu | Gly | Ala | Val | |
| | | 1090 | | | | 1095 | | | | | 1100 | | | | | |
| cag | tgg | atg | aac | cgg | ctg | ata | gcg | ttc | gct | tcg | cgg | ggt | aac | cac | gtc | 5161 |
| Gln | Trp | Met | Asn | Arg | Leu | Ile | Ala | Phe | Ala | Ser | Arg | Gly | Asn | His | Val | |
| | | 1105 | | | 1110 | | | | | 1115 | | | | | 1120 | |
| tcc | ccc | acg | cac | tat | gtg | cct | gag | agc | gac | gct | gca | gca | cgt | gtc | act | 5209 |
| Ser | Pro | Thr | His | Tyr | Val | Pro | Glu | Ser | Asp | Ala | Ala | Ala | Arg | Val | Thr | |
| | | | | 1125 | | | | | 1130 | | | | | 1135 | | |

| | |
|---|------|
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca | 5881 |
| Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala | |
| 1345 1350 1355 1360 | |

| | |
|---|------|
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |
| 1505 1510 1515 1520 | |
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | |
| 1525 1530 1535 | |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | |
| 1540 1545 1550 | |
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | 6505 |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | |
| 1555 1560 1565 | |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg | 6553 |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | |

| 1570 | 1575 | 1580 | |
|---|------|------|------|
| gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc | | | 6601 |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser | | | |
| 1585 | 1590 | 1595 | 1600 |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg | | | 6649 |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | | | |
| | 1605 | 1610 | 1615 |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | | | 6697 |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | | | |
| | 1620 | 1625 | 1630 |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat | | | 6745 |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | | | |
| | 1635 | 1640 | 1645 |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | | | 6793 |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | | | |
| | 1650 | 1655 | 1660 |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag | | | 6841 |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | | | |
| | 1665 | 1670 | 1675 |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | | | 6889 |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | | | |
| | 1685 | 1690 | 1695 |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | | | 6937 |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | | | |
| | 1700 | 1705 | 1710 |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | | | 6985 |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | | | |
| | 1715 | 1720 | 1725 |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | | | 7033 |
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | | | |
| | 1730 | 1735 | 1740 |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | | | 7081 |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | | | |
| | 1745 | 1750 | 1755 |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | | | 7129 |
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | | | |
| | 1765 | 1770 | 1775 |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | | | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | | | |
| | 1780 | 1785 | 1790 |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | | | 7225 |

| | |
|---|------|
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 | 1800 |
| 1805 | |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 | 1815 |
| 1820 | |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 | 1830 |
| 1835 | 1840 |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 | 1850 |
| 1855 | |
| ccc gaa gcc aga cag gcc ata agg tgc ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 | 1865 |
| 1870 | |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 | 1880 |
| 1885 | |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 | 1895 |
| 1900 | |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 | 1910 |
| 1915 | 1920 |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 | 1930 |
| 1935 | |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 | 1945 |
| 1950 | |
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 | 1960 |
| 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 | 1975 |
| 1980 | |
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 | 1990 |
| 1995 | 2000 |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 | 2010 |
| 2015 | |

| | |
|---|------|
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg | 8281 |
| Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp | |
| 2145 2150 2155 2160 | |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt | 8329 |
| Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg | |
| 2165 2170 2175 | |
| gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg | 8377 |
| Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly | |
| 2180 2185 2190 | |
| gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca | 8427 |
| Val Gly Ile Tyr Leu Leu Pro Asn Arg * | |
| 2195 2200 | |
| ggccaatagg ccatactgtt tttttccctt tttttttttt tttttttttt tttttttttt | 8487 |
| tttttttttt ttttttcctt tttttttcct ctttttttcc ttttttttcc tttggtggct | 8547 |
| ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg actgcagaga | 8607 |
| gtgctgatac tggcctctct gcagatcaag t | 8638 |

<210> 8
<211> 6

<212> DNA
 <213> HCV

 <400> 8
 accagc 6

 <210> 9
 <211> 63
 <212> DNA
 <213> HCV

 <400> 9
 gaattccaga tggcgcgccc agatgttaac cagatccatg gcacactcta gagtactgtc 60
 gac 63

 <210> 10
 <211> 33
 <212> DNA
 <213> HCV

 <400> 10
 cggaatcggtt aacagaccac aacggtttcc etc 33

 <210> 11
 <211> 30
 <212> DNA
 <213> HCV

 <400> 11
 ggcgtaccca tgggtattatc gtgtttttca 30

 <210> 12
 <211> 45
 <212> DNA
 <213> HCV

 <400> 12
 gcatatgaat tctaatacga ctcaactatag gccagccccc gattg 45

 <210> 13
 <211> 45
 <212> DNA
 <213> HCV

 <400> 13
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 <210> 14
 <211> 36
 <212> DNA
 <213> HCV

 <400> 14
 aaagggcgca tgattgaaca agatggattg cacgca 36

<210> 15
 <211> 39
 <212> DNA
 <213> HCV

 <400> 15
 gcatatgtta actcagaaga actcgtcaag aaggcgata 39

 <210> 16
 <211> 45
 <212> DNA
 <213> HCV

 <400> 16
 gcatatgaat tctaatacga ctcaactatag gccagccccc gattg 45

 <210> 17
 <211> 30
 <212> DNA
 <213> HCV

 <400> 17
 acgcagaaaag cgtctagcca tggcgtagt 30

 <210> 18
 <211> 30
 <212> DNA
 <213> HCV

 <400> 18
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 <210> 19
 <211> 26
 <212> DNA
 <213> HCV

 <220>
 <223> Label with FAM: fluorescence reporter dye

 <223> Label with TAMRA: Quencher dye

 <400> 19
 tggctctgcgg aacgggtgag tacacc 26

 <210> 20
 <211> 45
 <212> DNA
 <213> HCV

 <400> 20
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 <210> 21
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<212> DNA

<213> HCV

<400> 21

ggaacgcccc tcgtggccag ccacgat

27

<210> 22

<211> 23

<212> DNA

<213> HCV

<400> 22

gtcgtcttct ctgacatgga gac

23

<210> 23

<211> 27

<212> DNA

<213> HCV

<400> 23

gagttgctca gtggattgat gggcagc

27

<210> 24

<211> 8638

<212> DNA

<213> HCV

<220>

<221> CDS

<222> (1802)... (8407)

<400> 24

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|------|
| accagcccc | gattgggggc | gacactccac | catagatcac | tcccctgtga | ggaactactg | 60 |
| tcttcacgca | gaaagcgtct | agccatggcg | ttagtatgag | tgctcgtgcag | cctccaggac | 120 |
| ccccctccc | gggagagcca | tagtggtctg | cgaaccgggt | gagtacaccg | gaattgccag | 180 |
| gacgaccggg | tcctttcttg | gatcaaccgg | ctcaatgcct | ggagatttgg | gcgtgcccc | 240 |
| gcgagactgc | tagccgagta | gtgttgggtc | gcgaaaggcc | ttgtgggtact | gcctgatagg | 300 |
| gtgcttgcca | gtgccccggg | aggtctcgtg | gaccgtgcac | catgagcacg | aatcctaaac | 360 |
| ctcaaagaaa | aaccaaaggg | cgcgccatga | ttgaacaaga | tggattgcac | gcagggttctc | 420 |
| cggccgcttg | ggtggagagg | ctattcggct | atgactgggc | acaacagaca | atcggctgct | 480 |
| ctgatgccgc | cgtgttccgg | ctgtcagcgc | aggggcgccc | ggttcttttt | gtcaagaccg | 540 |
| acctgtccgg | tgccctgaat | gaactgcagg | acgaggcagc | gcggctatcg | tggctggcca | 600 |
| cgacgggcgt | tccttgccga | gctgtgctcg | acgttgtcac | tgaagcggga | agggactggc | 660 |
| tgctattggg | cgaagtgcgc | gggcaggatc | tcctgtcatc | tcaccttgct | cctgccgaga | 720 |
| aagtatccat | catggctgat | gcaatgcggc | ggctgcatac | gcttgatccg | gctacctgcc | 780 |
| cattcgacca | ccaagcgaaa | catcgcacgc | agcgagcacg | tactcggatg | gaagccggtc | 840 |
| ttgtcgatca | ggatgatctg | gacgaagagc | atcaggggct | cgcgccagcc | gaactgttcg | 900 |
| ccaggetcaa | ggcgcgcgat | cccgaacggc | aggatctcgt | cgtgacccat | ggcgatgcct | 960 |
| gcttgccgaa | tatcatgggt | gaaaatggcc | gcttttcttg | attcatcgac | tgtggccggc | 1020 |
| tgggtgtggc | ggaccgctat | caggacatag | cgttggctac | ccgtgatatt | gctgaagagc | 1080 |
| ttggcggcga | atgggctgac | cgcttcctcg | tgctttacgg | tatcgccgct | cccgattcgc | 1140 |
| agcgcacgc | cttctatcgc | cttcttgacg | agttcttctg | agttcgcgcc | cagatgttaa | 1200 |
| cagaccacaa | cggtttccct | ctagcgggat | caattccgcc | cccccccta | acgttactgg | 1260 |
| ccgaagccgc | ttggaataag | gccggtgtgc | gtttgtctat | atgttatatt | ccaccatatt | 1320 |
| gccgtctttt | ggcaatgtga | gggcccggaa | acctggccct | gtcttcttga | cgagcattcc | 1380 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|------------|------|
| taggggtctt | tcccctctcg | ccaaaggaat | gcaaggtctg | ttgaatgtcg | tgaaggaagc | 1440 |
| agttcctctg | gaagcttctt | gaagacaaac | aacgtctgta | gcgacccttt | gcaggcagcg | 1500 |
| gaacccccca | cctggcgaca | ggtgcctctg | cggccaaaag | ccacgtgtat | aagatacacc | 1560 |
| tgcaaaggcg | gcacaacccc | agtgccacgt | tgtgagttgg | atagttgtgg | aaagagtcaa | 1620 |
| atggctctcc | tcaagcgtat | tcaacaaggg | gctgaaggat | gcccagaagg | tacccattg | 1680 |
| tatgggatct | gatctggggc | ctcgggtgcac | atgctttaca | tgtgtttagt | cgagggttaa | 1740 |
| aaacgtctag | gcccccgaa | ccacggggac | gtggttttcc | tttgaaaaac | acgataatac | 1800 |
| c atg gac | cgg gag atg | gca gca tcg | tgc gga ggc | gcg gtt ttc | gta ggt | 1849 |
| Met Asp Arg | Glu Met Ala | Ala Ala Ser | Cys Gly Gly | Ala Val Phe | Val Gly | |
| 1 | 5 | 10 | 15 | | | |
| | | | | | | |
| ctg ata ctc | ttg acc ttg | tca ccg cac | tat aag ctg | ttc ctc gct | agg | 1897 |
| Leu Ile Leu | Leu Thr Leu | Ser Pro His | Tyr Lys Leu | Phe Leu Ala | Arg | |
| 20 | 25 | 30 | | | | |
| | | | | | | |
| ctc ata tgg | tgg tta caa | tat ttt atc | acc agg gcc | gag gca cac | ttg | 1945 |
| Leu Ile Trp | Trp Leu Gln | Tyr Phe Ile | Thr Arg Ala | Glu Ala His | Leu | |
| 35 | 40 | 45 | | | | |
| | | | | | | |
| caa gtg tgg | atc ccc ccc | ctc aac gtt | cgg ggg ggc | cgc gat gcc | gtc | 1993 |
| Gln Val Trp | Ile Pro Pro | Leu Asn Val | Arg Gly Gly | Arg Asp Ala | Val | |
| 50 | 55 | 60 | | | | |
| | | | | | | |
| atc ctc ctc | acg tgc gcg | atc cac cca | gag cta atc | ttt acc atc | acc | 2041 |
| Ile Leu Leu | Thr Cys Ala | Ile His Pro | Glu Leu Ile | Phe Thr Ile | Thr | |
| 65 | 70 | 75 | 80 | | | |
| | | | | | | |
| aaa atc ttg | ctc gcc ata | ctc ggt cca | ctc atg gtg | ctc cag gct | ggt | 2089 |
| Lys Ile Leu | Leu Ala Ile | Leu Gly Pro | Leu Met Val | Leu Gln Ala | Gly | |
| 85 | 90 | 95 | | | | |
| | | | | | | |
| ata acc aaa | gtg ccg tac | ttc gtg cgc | gca cac ggg | ctc att cgt | gca | 2137 |
| Ile Thr Lys | Val Pro Tyr | Phe Val Arg | Ala His Gly | Leu Ile Arg | Ala | |
| 100 | 105 | 110 | | | | |
| | | | | | | |
| tgc atg ctg | gtg cgg aag | gtt gct ggg | ggt cat tat | gtc caa atg | gct | 2185 |
| Cys Met Leu | Val Arg Lys | Val Ala Gly | Gly Gly His | Tyr Val Gln | Met Ala | |
| 115 | 120 | 125 | | | | |
| | | | | | | |
| ctc atg aag | ttg gcc gca | ctg aca ggt | acg tac gtt | tat gac cat | ctc | 2233 |
| Leu Met Lys | Leu Ala Ala | Leu Thr Gly | Thr Tyr Val | Tyr Asp His | Leu | |
| 130 | 135 | 140 | | | | |
| | | | | | | |
| acc cca ctg | cgg gac tgg | gcc cac gcg | ggc cta cga | gac ctt gcg | gtg | 2281 |
| Thr Pro Leu | Arg Asp Trp | Ala His Ala | Gly Leu Arg | Asp Leu Ala | Val | |
| 145 | 150 | 155 | 160 | | | |
| | | | | | | |
| gca gtt gag | ccc gtc gtc | ttc tct gat | atg gag acc | aag gtt atc | acc | 2329 |
| Ala Val Glu | Pro Val Val | Phe Ser Asp | Met Glu Thr | Lys Val Ile | Thr | |
| 165 | 170 | 175 | | | | |
| | | | | | | |
| tgg ggg gca | gac acc gcg | gcg tgt ggg | gac atc atc | ttg ggc ctg | ccc | 2377 |
| Trp Gly Ala | Asp Thr Ala | Ala Cys Gly | Asp Ile Ile | Leu Gly Leu | Pro | |
| 180 | 185 | 190 | | | | |

| | |
|---|------|
| gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc | 2425 |
| Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser | |
| 195 200 205 | |
| ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc | 2473 |
| Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser | |
| 210 215 220 | |
| caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc | 2521 |
| Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly | |
| 225 230 235 240 | |
| cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca | 2569 |
| Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala | |
| 245 250 255 | |
| aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc | 2617 |
| Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val | |
| 260 265 270 | |
| tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc | 2665 |
| Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile | |
| 275 280 285 | |
| acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg | 2713 |
| Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala | |
| 290 295 300 | |
| ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac | 2761 |
| Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp | |
| 305 310 315 320 | |
| ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg | 2809 |
| Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg | |
| 325 330 335 | |
| ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg | 2857 |
| Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu | |
| 340 345 350 | |
| aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg | 2905 |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val | |
| 355 360 365 | |
| ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg | 2953 |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val | |
| 370 375 380 | |
| gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc | 3001 |
| Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val | |
| 385 390 395 400 | |
| ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg | 3049 |
| Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val | |
| 405 410 415 | |

| | |
|---|------|
| gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag.gtg ccg | 3097 |
| Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro | |
| 420 425 430 | |
| gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc | 3145 |
| Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser | |
| 435 440 445 | |
| gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt | 3193 |
| Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly | |
| 450 455 460 | |
| atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc | 3241 |
| Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala | |
| 465 470 475 480 | |
| ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc | 3289 |
| Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys | |
| 485 490 495 | |
| tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act | 3337 |
| Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr | |
| 500 505 510 | |
| gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag | 3385 |
| Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu | |
| 515 520 525 | |
| acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga | 3433 |
| Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly | |
| 530 535 540 | |
| tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc | 3481 |
| Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser | |
| 545 550 555 560 | |
| act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc | 3529 |
| Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile | |
| 565 570 575 | |
| aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat | 3577 |
| Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp | |
| 580 585 590 | |
| gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat | 3625 |
| Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr | |
| 595 600 605 | |
| tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att | 3673 |
| Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile | |
| 610 615 620 | |
| gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac | 3721 |
| Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp | |

| 625 | | | | | | 630 | | | | | | 635 | | | | | | 640 | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--|-----|--|
| tca | gtg | atc | gac | tgc | aat | aca | tgt | gtc | acc | cag | aca | gtc | gac | ttc | agc | 3769 | | | |
| Ser | Val | Ile | Asp | Cys | Asn | Thr | Cys | Val | Thr | Gln | Thr | Val | Asp | Phe | Ser | | | | |
| | | | | 645 | | | | | 650 | | | | | 655 | | | | | |
| ctg | gac | ccg | acc | ttc | acc | att | gag | acg | acc | gtg | cca | caa | gac | gcg | 3817 | | | | |
| Leu | Asp | Pro | Thr | Phe | Thr | Ile | Glu | Thr | Thr | Thr | Val | Pro | Gln | Asp | Ala | | | | |
| | | | 660 | | | | | 665 | | | | | 670 | | | | | | |
| gtg | tca | cgc | tcg | cag | cgg | cga | ggc | agg | act | ggg | agg | ggc | agg | atg | ggc | 3865 | | | |
| Val | Ser | Arg | Ser | Gln | Arg | Arg | Gly | Arg | Thr | Gly | Arg | Gly | Arg | Met | Gly | | | | |
| | | 675 | | | | | 680 | | | | | 685 | | | | | | | |
| att | tac | agg | ttt | gtg | act | cca | gga | gaa | cgg | ccc | tcg | ggc | atg | ttc | gat | 3913 | | | |
| Ile | Tyr | Arg | Phe | Val | Thr | Pro | Gly | Glu | Arg | Pro | Ser | Gly | Met | Phe | Asp | | | | |
| | 690 | | | | | 695 | | | | | 700 | | | | | | | | |
| tcc | tcg | gtt | ctg | tgc | gag | tgc | tat | gac | gcg | ggc | tgt | gct | tgg | tac | gag | 3961 | | | |
| Ser | Ser | Val | Leu | Cys | Glu | Cys | Tyr | Asp | Ala | Gly | Cys | Ala | Trp | Tyr | Glu | | | | |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 | | | | |
| ctc | acg | ccc | gcc | gag | acc | tca | gtt | agg | ttg | cgg | gct | tac | cta | aac | aca | 4009 | | | |
| Leu | Thr | Pro | Ala | Glu | Thr | Ser | Val | Arg | Leu | Arg | Ala | Tyr | Leu | Asn | Thr | | | | |
| | | | | 725 | | | | | 730 | | | | | 735 | | | | | |
| cca | ggg | ttg | ccc | gtc | tgc | cag | gac | cat | ctg | gag | ttc | tgg | gag | agc | gtc | 4057 | | | |
| Pro | Gly | Leu | Pro | Val | Cys | Gln | Asp | His | Leu | Glu | Phe | Trp | Glu | Ser | Val | | | | |
| | | | 740 | | | | | 745 | | | | | 750 | | | | | | |
| ttt | aca | ggc | ctc | acc | cac | ata | gac | gcc | cat | ttc | ttg | tcc | cag | act | aag | 4105 | | | |
| Phe | Thr | Gly | Leu | Thr | His | Ile | Asp | Ala | His | Phe | Leu | Ser | Gln | Thr | Lys | | | | |
| | | 755 | | | | | 760 | | | | | 765 | | | | | | | |
| cag | gca | gga | gac | aac | ttc | ccc | tac | ctg | gta | gca | tac | cag | gct | acg | gtg | 4153 | | | |
| Gln | Ala | Gly | Asp | Asn | Phe | Pro | Tyr | Leu | Val | Ala | Tyr | Gln | Ala | Thr | Val | | | | |
| | 770 | | | | | 775 | | | | | 780 | | | | | | | | |
| tgc | gcc | agg | gct | cag | gct | cca | cct | cca | tcg | tgg | gac | caa | atg | tgg | aag | 4201 | | | |
| Cys | Ala | Arg | Ala | Gln | Ala | Pro | Pro | Pro | Ser | Trp | Asp | Gln | Met | Trp | Lys | | | | |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 | | | | |
| tgt | ctc | ata | cgg | cta | aag | cct | acg | ctg | cac | ggg | cca | acg | ccc | ctg | ctg | 4249 | | | |
| Cys | Leu | Ile | Arg | Leu | Lys | Pro | Thr | Leu | His | Gly | Pro | Thr | Pro | Leu | Leu | | | | |
| | | | | 805 | | | | | 810 | | | | | 815 | | | | | |
| tat | agg | ctg | gga | gcc | gtt | caa | aac | gag | gtt | act | acc | aca | cac | ccc | ata | 4297 | | | |
| Tyr | Arg | Leu | Gly | Ala | Val | Gln | Asn | Glu | Val | Thr | Thr | Thr | His | Pro | Ile | | | | |
| | | | 820 | | | | | 825 | | | | | 830 | | | | | | |
| acc | aaa | tac | atc | atg | gca | tgc | atg | tcg | gct | gac | ctg | gag | gtc | gtc | acg | 4345 | | | |
| Thr | Lys | Tyr | Ile | Met | Ala | Cys | Met | Ser | Ala | Asp | Leu | Glu | Val | Val | Thr | | | | |
| | | 835 | | | | | 840 | | | | | 845 | | | | | | | |
| agc | acc | tgg | gtg | ctg | gta | ggc | gga | gtc | cta | gca | gct | ctg | gcc | gcg | tat | 4393 | | | |

| | | | | | | | | | | | | | | | | |
|------|------|-----|------|------|------|------|------|------|------|-----|------|-----|------|-----|------|------|
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | |
| 850 | | | | | | 855 | | | | | 860 | | | | | |
| tgc | ctg | aca | aca | ggc | agc | gtg | gtc | att | gtg | ggc | agg | atc | atc | ttg | tcc | 4441 |
| Cys | Leu | Thr | Thr | Gly | Ser | Val | Val | Ile | Val | Gly | Arg | Ile | Ile | Leu | Ser | |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 | |
| gga | aag | ccg | gcc | atc | att | ccc | gac | agg | gaa | gtc | ctt | tac | cgg | gag | ttc | 4489 |
| Gly | Lys | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Leu | Tyr | Arg | Glu | Phe | |
| | | | | 885 | | | | | 890 | | | | | 895 | | |
| gat | gag | atg | gaa | gag | tgc | gcc | tca | cac | ctc | cct | tac | atc | gaa | cag | gga | 4537 |
| Asp | Glu | Met | Glu | Glu | Cys | Ala | Ser | His | Leu | Pro | Tyr | Ile | Glu | Gln | Gly | |
| | | | 900 | | | | | 905 | | | | | 910 | | | |
| atg | cag | ctc | gcc | gaa | caa | ttc | aaa | cag | aag | gca | atc | ggg | ttg | ctg | caa | 4585 |
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | |
| | | 915 | | | | | 920 | | | | | 925 | | | | |
| aca | gcc | acc | aag | caa | gcg | gag | gct | gct | gct | ccc | gtg | gtg | gaa | tcc | aag | 4633 |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | |
| | 930 | | | | | 935 | | | | | 940 | | | | | |
| tgg | cgg | acc | ctc | gaa | gcc | ttc | tgg | gcg | aag | cat | atg | tgg | aat | ttc | atc | 4681 |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | |
| 945 | | | | | 950 | | | | | 955 | | | | | 960 | |
| agc | ggg | ata | caa | tat | tta | gca | ggc | ttg | tcc | act | ctg | cct | ggc | aac | ccc | 4729 |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | |
| | | | | 965 | | | | 970 | | | | | | 975 | | |
| gcg | ata | gca | tca | ctg | atg | gca | ttc | aca | gcc | tct | atc | acc | agc | ccg | ctc | 4777 |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | |
| | | | 980 | | | | | 985 | | | | | 990 | | | |
| acc | acc | caa | cat | acc | ctc | ctg | ttt | aac | atc | ctg | ggg | gga | tgg | gtg | gcc | 4825 |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | |
| | | 995 | | | | | 1000 | | | | 1005 | | | | | |
| gcc | caa | ctt | gct | cct | ccc | agc | gct | gct | tct | gct | ttc | gta | ggc | gcc | ggc | 4873 |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | |
| 1025 | | | | | 1030 | | | | 1035 | | | | | | 1040 | |
| gat | att | ttg | gca | ggt | tat | gga | gca | ggg | gtg | gca | ggc | gcg | ctc | gtg | gcc | 4969 |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | |
| | | | | 1045 | | | | 1050 | | | | | 1055 | | | |
| ttt | aag | gtc | atg | agc | ggc | gag | atg | ccc | tcc | acc | gag | gac | ctg | gtt | aac | 5017 |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | |
| | | | 1060 | | | | | 1065 | | | | | 1070 | | | |

| | |
|---|------|
| cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg | 5065 |
| Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val | |
| 1075 1080 1085 | |
| tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg | 5113 |
| Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val | |
| 1090 1095 1100 | |
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | |
| 1105 1110 1115 1120 | |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | |
| 1125 1130 1135 | |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| ggt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Gly Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |

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|---|------|
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca | 5881 |
| Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |

| 1505 | 1510 | 1515 | 1520 | |
|---|------|------|------|------|
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | | | | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | 1525 | 1530 | 1535 | |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | | | | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | 1540 | 1545 | 1550 | |
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | | | | 6505 |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | 1555 | 1560 | 1565 | |
| gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg | | | | 6553 |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | 1570 | 1575 | 1580 | |
| gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc | | | | 6601 |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser | 1585 | 1590 | 1595 | 1600 |
| gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg | | | | 6649 |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | 1605 | 1610 | 1615 | |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | | | | 6697 |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | 1620 | 1625 | 1630 | |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat | | | | 6745 |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | 1635 | 1640 | 1645 | |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | | | | 6793 |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | 1650 | 1655 | 1660 | |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag | | | | 6841 |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | 1665 | 1670 | 1675 | 1680 |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | | | | 6889 |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | 1685 | 1690 | 1695 | |
| gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc | | | | 6937 |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | 1700 | 1705 | 1710 | |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | | | | 6985 |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | 1715 | 1720 | 1725 | |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | | | | 7033 |

| | |
|---|----------------|
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | |
| 1730 | 1735 1740 |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | |
| 1745 | 1750 1755 1760 |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 |
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| 1765 | 1770 1775 |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| 1780 | 1785 1790 |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 | 1800 1805 |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 | 1815 1820 |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 | 1830 1835 1840 |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 | 1850 1855 |
| ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 | 1865 1870 |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 | 1880 1885 |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 | 1895 1900 |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 | 1910 1915 1920 |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 | 1930 1935 |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 | 1945 1950 |

| | |
|---|------|
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 1960 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 1975 1980 | |
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 1990 1995 2000 | |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 2010 2015 | |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg | 8281 |
| Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp | |
| 2145 2150 2155 2160 | |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt | 8329 |
| Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg | |
| 2165 2170 2175 | |

gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg 8377
 Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
 2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acgaggagct aaacactcca 8427
 Val Gly Ile Tyr Leu Leu Pro Asn Arg *
 2195 2200

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 <213> HCV

<220>
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 c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849

| Met | Asp | Arg | Glu | Met | Ala | Ala | Ser | Cys | Gly | Gly | Ala | Val | Phe | Val | Gly | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| ctg | ata | ctc | ttg | acc | ttg | tca | ccg | cac | tat | aag | ctg | ttc | ctc | gct | agg | 1897 |
| Leu | Ile | Leu | Leu | Thr | Leu | Ser | Pro | His | Tyr | Lys | Leu | Phe | Leu | Ala | Arg | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| ctc | ata | tgg | tgg | tta | caa | tat | ttt | atc | acc | agg | gcc | gag | gca | cac | ttg | 1945 |
| Leu | Ile | Trp | Trp | Leu | Gln | Tyr | Phe | Ile | Thr | Arg | Ala | Glu | Ala | His | Leu | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| caa | gtg | tgg | atc | ccc | ccc | ctc | aac | gtt | cgg | ggg | ggc | cgc | gat | gcc | gtc | 1993 |
| Gln | Val | Trp | Ile | Pro | Pro | Leu | Asn | Val | Arg | Gly | Gly | Arg | Asp | Ala | Val | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| atc | ctc | ctc | acg | tgc | gcg | atc | cac | cca | gag | cta | atc | ttt | acc | atc | acc | 2041 |
| Ile | Leu | Leu | Thr | Cys | Ala | Ile | His | Pro | Glu | Leu | Ile | Phe | Thr | Ile | Thr | |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| aaa | atc | ttg | ctc | gcc | ata | ctc | ggt | cca | ctc | atg | gtg | ctc | cag | gct | ggt | 2089 |
| Lys | Ile | Leu | Leu | Ala | Ile | Leu | Gly | Pro | Leu | Met | Val | Leu | Gln | Ala | Gly | |
| | | | | 85 | | | | 90 | | | | | | 95 | | |
| ata | acc | aaa | gtg | ccg | tac | ttc | gtg | cgc | gca | cac | ggg | ctc | att | cgt | gca | 2137 |
| Ile | Thr | Lys | Val | Pro | Tyr | Phe | Val | Arg | Ala | His | Gly | Leu | Ile | Arg | Ala | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| tgc | atg | ctg | gtg | cgg | aag | gtt | gct | ggg | ggt | cat | tat | gtc | caa | atg | gct | 2185 |
| Cys | Met | Leu | Val | Arg | Lys | Val | Ala | Gly | Gly | His | Tyr | Val | Gln | Met | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| ctc | atg | aag | ttg | gcc | gca | ctg | aca | ggt | acg | tac | gtt | tat | gac | cat | ctc | 2233 |
| Leu | Met | Lys | Leu | Ala | Ala | Leu | Thr | Gly | Thr | Tyr | Val | Tyr | Asp | His | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| acc | cca | ctg | cgg | gac | tgg | gcc | cac | gcg | ggc | cta | cga | gac | ctt | gcg | gtg | 2281 |
| Thr | Pro | Leu | Arg | Asp | Trp | Ala | His | Ala | Gly | Leu | Arg | Asp | Leu | Ala | Val | |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| gca | gtt | gag | ccc | gtc | gtc | ttc | tct | gat | atg | gag | acc | aag | gtt | atc | acc | 2329 |
| Ala | Val | Glu | Pro | Val | Val | Phe | Ser | Asp | Met | Glu | Thr | Lys | Val | Ile | Thr | |
| | | | 165 | | | | | 170 | | | | | | 175 | | |
| tgg | ggg | gca | gac | acc | gcg | gcg | tgt | ggg | gac | atc | atc | ttg | ggc | ctg | ccc | 2377 |
| Trp | Gly | Ala | Asp | Thr | Ala | Ala | Cys | Gly | Asp | Ile | Ile | Leu | Gly | Leu | Pro | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| gtc | tcc | gcc | cgc | agg | ggg | agg | gag | ata | cat | ctg | gga | ccg | gca | gac | agc | 2425 |
| Val | Ser | Ala | Arg | Arg | Gly | Arg | Glu | Ile | His | Leu | Gly | Pro | Ala | Asp | Ser | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| ctt | gaa | ggg | cag | ggg | tgg | cga | ctc | ctc | gcg | cct | att | acg | gcc | tac | tcc | 2473 |
| Leu | Glu | Gly | Gln | Gly | Trp | Arg | Leu | Leu | Ala | Pro | Ile | Thr | Ala | Tyr | Ser | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |

| | |
|---|------|
| caa cag acg cga ggc cta ctt ggc tgc atc atc acc agc ctc aca ggc | 2521 |
| Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly | |
| 225 230 235 240 | |
| cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca | 2569 |
| Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala | |
| 245 250 255 | |
| aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc | 2617 |
| Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val | |
| 260 265 270 | |
| tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc | 2665 |
| Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile | |
| 275 280 285 | |
| acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg | 2713 |
| Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala | |
| 290 295 300 | |
| ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac | 2761 |
| Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp | |
| 305 310 315 320 | |
| ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cgg cgg | 2809 |
| Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg | |
| 325 330 335 | |
| ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg | 2857 |
| Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu | |
| 340 345 350 | |
| aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg | 2905 |
| Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val | |
| 355 360 365 | |
| ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg | 2953 |
| Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val | |
| 370 375 380 | |
| gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc | 3001 |
| Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val | |
| 385 390 395 400 | |
| ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg | 3049 |
| Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val | |
| 405 410 415 | |
| gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg | 3097 |
| Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro | |
| 420 425 430 | |
| gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc | 3145 |
| Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser | |
| 435 440 445 | |

| | |
|---|------|
| gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt | 3193 |
| Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly | |
| 450 455 460 | |
| atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc | 3241 |
| Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala | |
| 465 470 475 480 | |
| ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc | 3289 |
| Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys | |
| 485 490 495 | |
| tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act | 3337 |
| Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr | |
| 500 505 510 | |
| gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag | 3385 |
| Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu | |
| 515 520 525 | |
| acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga | 3433 |
| Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly | |
| 530 535 540 | |
| tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc | 3481 |
| Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser | |
| 545 550 555 560 | |
| act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc | 3529 |
| Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile | |
| 565 570 575 | |
| aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat | 3577 |
| Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp | |
| 580 585 590 | |
| gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat | 3625 |
| Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr | |
| 595 600 605 | |
| tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att | 3673 |
| Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile | |
| 610 615 620 | |
| gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac | 3721 |
| Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp | |
| 625 630 635 640 | |
| tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc | 3769 |
| Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser | |
| 645 650 655 | |
| ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg | 3817 |
| Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala | |

| 660 | | | | | | | | | | 665 | | | | | 670 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|--|--|--|
| gtg | tca | cgc | tcg | cag | cgg | cga | ggc | agg | act | ggg | agg | ggc | agg | atg | ggc | 3865 | | | | |
| Val | Ser | Arg | Ser | Gln | Arg | Arg | Gly | Arg | Thr | Gly | Arg | Gly | Arg | Met | Gly | | | | | |
| | | 675 | | | | | 680 | | | | | 685 | | | | | | | | |
| att | tac | agg | ttt | gtg | act | cca | gga | gaa | cgg | ccc | tcg | ggc | atg | ttc | gat | 3913 | | | | |
| Ile | Tyr | Arg | Phe | Val | Thr | Pro | Gly | Glu | Arg | Pro | Ser | Gly | Met | Phe | Asp | | | | | |
| | 690 | | | | | 695 | | | | 700 | | | | | | | | | | |
| tcc | tcg | gtt | ctg | tgc | gag | tgc | tat | gac | gcg | ggc | tgt | gct | tgg | tac | gag | 3961 | | | | |
| Ser | Ser | Val | Leu | Cys | Glu | Cys | Tyr | Asp | Ala | Gly | Cys | Ala | Trp | Tyr | Glu | | | | | |
| 705 | | | | 710 | | | | | | 715 | | | | | 720 | | | | | |
| ctc | acg | ccc | gcc | gag | acc | tca | gtt | agg | ttg | cgg | gct | tac | cta | aac | aca | 4009 | | | | |
| Leu | Thr | Pro | Ala | Glu | Thr | Ser | Val | Arg | Leu | Arg | Ala | Tyr | Leu | Asn | Thr | | | | | |
| | | | | 725 | | | | 730 | | | | | | 735 | | | | | | |
| cca | ggg | ttg | ccc | gtc | tgc | cag | gac | cat | ctg | gag | ttc | tgg | gag | ggc | gtc | 4057 | | | | |
| Pro | Gly | Leu | Pro | Val | Cys | Gln | Asp | His | Leu | Glu | Phe | Trp | Glu | Gly | Val | | | | | |
| | | | 740 | | | | 745 | | | | | | 750 | | | | | | | |
| ttt | aca | ggc | ctc | acc | cac | ata | gac | gcc | cat | ttc | ttg | tcc | cag | act | aag | 4105 | | | | |
| Phe | Thr | Gly | Leu | Thr | His | Ile | Asp | Ala | His | Phe | Leu | Ser | Gln | Thr | Lys | | | | | |
| | | 755 | | | | | 760 | | | | | 765 | | | | | | | | |
| cag | gca | gga | gac | aac | ttc | ccc | tac | ctg | gta | gca | tac | cag | gct | acg | gtg | 4153 | | | | |
| Gln | Ala | Gly | Asp | Asn | Phe | Pro | Tyr | Leu | Val | Ala | Tyr | Gln | Ala | Thr | Val | | | | | |
| | 770 | | | | | 775 | | | | | 780 | | | | | | | | | |
| tgc | gcc | agg | gct | cag | gct | cca | cct | cca | tcg | tgg | gac | caa | atg | tgg | aag | 4201 | | | | |
| Cys | Ala | Arg | Ala | Gln | Ala | Pro | Pro | Pro | Ser | Trp | Asp | Gln | Met | Trp | Lys | | | | | |
| 785 | | | | 790 | | | | | | 795 | | | | | 800 | | | | | |
| tgt | ctc | ata | cgg | cta | aag | cct | acg | ctg | cac | ggg | cca | acg | ccc | ctg | ctg | 4249 | | | | |
| Cys | Leu | Ile | Arg | Leu | Lys | Pro | Thr | Leu | His | Gly | Pro | Thr | Pro | Leu | Leu | | | | | |
| | | | | 805 | | | | 810 | | | | | | 815 | | | | | | |
| tat | agg | ctg | gga | gcc | gtt | caa | aac | gag | gtt | act | acc | aca | cac | ccc | ata | 4297 | | | | |
| Tyr | Arg | Leu | Gly | Ala | Val | Gln | Asn | Glu | Val | Thr | Thr | Thr | His | Pro | Ile | | | | | |
| | | | 820 | | | | | 825 | | | | | 830 | | | | | | | |
| acc | aaa | tac | atc | atg | gca | tgc | atg | tcg | gct | gac | ctg | gag | gtc | gtc | acg | 4345 | | | | |
| Thr | Lys | Tyr | Ile | Met | Ala | Cys | Met | Ser | Ala | Asp | Leu | Glu | Val | Val | Thr | | | | | |
| | | 835 | | | | | 840 | | | | | 845 | | | | | | | | |
| agc | acc | tgg | gtg | ctg | gta | ggc | gga | gtc | cta | gca | gct | ctg | gct | gcg | tat | 4393 | | | | |
| Ser | Thr | Trp | Val | Leu | Val | Gly | Gly | Val | Leu | Ala | Ala | Leu | Ala | Ala | Tyr | | | | | |
| | | 850 | | | | 855 | | | | | 860 | | | | | | | | | |
| tgc | ctg | aca | aca | ggc | agc | gtg | gtc | att | gtg | ggc | agg | atc | atc | ttg | tcc | 4441 | | | | |
| Cys | Leu | Thr | Thr | Gly | Ser | Val | Val | Ile | Val | Gly | Arg | Ile | Ile | Leu | Ser | | | | | |
| 865 | | | | 870 | | | | | | 875 | | | | | 880 | | | | | |
| gga | agg | ccg | gcc | atc | att | ccc | gac | agg | gaa | gtc | ctt | tac | cgg | gag | ttc | 4489 | | | | |

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|------|------|------|------|------|-----|------|------|------|------|-----|------|------|------|------|-----|------|--|
| Gly | Arg | Pro | Ala | Ile | Ile | Pro | Asp | Arg | Glu | Val | Leu | Tyr | Arg | Glu | Phe | | |
| | | | | 885 | | | | | 890 | | | | | 895 | | | |
| gat | gag | atg | gaa | gag | tgt | gcc | tca | cac | ctc | cct | tac | atc | gaa | cag | gga | 4537 | |
| Asp | Glu | Met | Glu | Glu | Cys | Ala | Ser | His | Leu | Pro | Tyr | Ile | Glu | Gln | Gly | | |
| | | | 900 | | | | | 905 | | | | | 910 | | | | |
| atg | cag | ctc | gcc | gaa | caa | ttc | aaa | cag | aag | gca | atc | ggg | ttg | ctg | caa | 4585 | |
| Met | Gln | Leu | Ala | Glu | Gln | Phe | Lys | Gln | Lys | Ala | Ile | Gly | Leu | Leu | Gln | | |
| | | 915 | | | | | 920 | | | | | 925 | | | | | |
| aca | gcc | acc | aag | caa | gcg | gag | gct | gct | gct | ccc | gtg | gtg | gaa | tcc | aag | 4633 | |
| Thr | Ala | Thr | Lys | Gln | Ala | Glu | Ala | Ala | Ala | Pro | Val | Val | Glu | Ser | Lys | | |
| | 930 | | | | | 935 | | | | | 940 | | | | | | |
| tgg | cgg | acc | ctc | gaa | gcc | ttc | tgg | gcg | aag | cat | atg | tgg | aat | ttc | atc | 4681 | |
| Trp | Arg | Thr | Leu | Glu | Ala | Phe | Trp | Ala | Lys | His | Met | Trp | Asn | Phe | Ile | | |
| 945 | | | | 950 | | | | | | 955 | | | | 960 | | | |
| agc | ggg | ata | caa | tat | tta | gca | ggc | ttg | tcc | act | ctg | cct | ggc | aac | ccc | 4729 | |
| Ser | Gly | Ile | Gln | Tyr | Leu | Ala | Gly | Leu | Ser | Thr | Leu | Pro | Gly | Asn | Pro | | |
| | | | 965 | | | | | 970 | | | | | 975 | | | | |
| gcg | ata | gca | tca | ctg | atg | gca | ttc | aca | gcc | tct | atc | acc | agc | ccg | ctc | 4777 | |
| Ala | Ile | Ala | Ser | Leu | Met | Ala | Phe | Thr | Ala | Ser | Ile | Thr | Ser | Pro | Leu | | |
| | | | 980 | | | | | 985 | | | | | 990 | | | | |
| acc | acc | caa | cat | acc | ctc | ctg | ttt | aac | atc | ctg | ggg | gga | tgg | gtg | gcc | 4825 | |
| Thr | Thr | Gln | His | Thr | Leu | Leu | Phe | Asn | Ile | Leu | Gly | Gly | Trp | Val | Ala | | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | | |
| gcc | caa | ctt | gct | cct | ccc | agc | gct | gct | tcc | gct | ttc | gta | ggc | gcc | ggc | 4873 | |
| Ala | Gln | Leu | Ala | Pro | Pro | Ser | Ala | Ala | Ser | Ala | Phe | Val | Gly | Ala | Gly | | |
| | 1010 | | | | | 1015 | | | | | 1020 | | | | | | |
| atc | gct | gga | gcg | gct | gtt | ggc | agc | ata | ggc | ctt | ggg | aag | gtg | ctt | gtg | 4921 | |
| Ile | Ala | Gly | Ala | Ala | Val | Gly | Ser | Ile | Gly | Leu | Gly | Lys | Val | Leu | Val | | |
| 1025 | | | | 1030 | | | | | 1035 | | | | | 1040 | | | |
| gat | att | ttg | gca | ggt | tat | gga | gca | ggg | gtg | gca | ggc | gcg | ctc | gtg | gcc | 4969 | |
| Asp | Ile | Leu | Ala | Gly | Tyr | Gly | Ala | Gly | Val | Ala | Gly | Ala | Leu | Val | Ala | | |
| | | | 1045 | | | | | 1050 | | | | | 1055 | | | | |
| ttt | aag | gtc | atg | agc | ggc | gag | atg | ccc | tcc | acc | gag | gac | ctg | gtt | aac | 5017 | |
| Phe | Lys | Val | Met | Ser | Gly | Glu | Met | Pro | Ser | Thr | Glu | Asp | Leu | Val | Asn | | |
| | | 1060 | | | | | | 1065 | | | | 1070 | | | | | |
| cta | ctc | cct | gct | atc | ctc | tcc | cct | ggc | gcc | cta | gtc | gtc | ggg | gtc | gtg | 5065 | |
| Leu | Leu | Pro | Ala | Ile | Leu | Ser | Pro | Gly | Ala | Leu | Val | Val | Gly | Val | Val | | |
| | | 1075 | | | | | 1080 | | | | | 1085 | | | | | |
| tgc | gca | gcg | ata | ctg | cgt | cgg | cac | gtg | ggc | cca | ggg | gag | ggg | gct | gtg | 5113 | |
| Cys | Ala | Ala | Ile | Leu | Arg | Arg | His | Val | Gly | Pro | Gly | Glu | Gly | Ala | Val | | |
| | 1090 | | | | | 1095 | | | | | 1100 | | | | | | |

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|---|------|
| cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc | 5161 |
| Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val | |
| 1105 1110 1115 1120 | |
| tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act | 5209 |
| Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr | |
| 1125 1130 1135 | |
| cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac | 5257 |
| Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His | |
| 1140 1145 1150 | |
| cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta | 5305 |
| Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu | |
| 1155 1160 1165 | |
| aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc | 5353 |
| Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala | |
| 1170 1175 1180 | |
| tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc | 5401 |
| Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe | |
| 1185 1190 1195 1200 | |
| tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg | 5449 |
| Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met | |
| 1205 1210 1215 | |
| caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac | 5497 |
| Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn | |
| 1220 1225 1230 | |
| tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat | 5545 |
| Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His | |
| 1235 1240 1245 | |
| gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc | 5593 |
| Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser | |
| 1250 1255 1260 | |
| ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag | 5641 |
| Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu | |
| 1265 1270 1275 1280 | |
| tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg | 5689 |
| Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met | |
| 1285 1290 1295 | |
| acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc | 5737 |
| Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe | |
| 1300 1305 1310 | |
| ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc | 5785 |
| Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys | |
| 1315 1320 1325 | |

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|---|------|
| aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa | 5833 |
| Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln | |
| 1330 1335 1340 | |
| tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca | 5881 |
| Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala | |
| 1345 1350 1355 1360 | |
| gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg | 5929 |
| Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr | |
| 1365 1370 1375 | |
| gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca | 5977 |
| Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser | |
| 1380 1385 1390 | |
| tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc | 6025 |
| Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr | |
| 1395 1400 1405 | |
| cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg | 6073 |
| Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp | |
| 1410 1415 1420 | |
| cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag | 6121 |
| Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys | |
| 1425 1430 1435 1440 | |
| gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag | 6169 |
| Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu | |
| 1445 1450 1455 | |
| agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc | 6217 |
| Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe | |
| 1460 1465 1470 | |
| cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg | 6265 |
| Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu | |
| 1475 1480 1485 | |
| tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg | 6313 |
| Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly | |
| 1490 1495 1500 | |
| tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg | 6361 |
| Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg | |
| 1505 1510 1515 1520 | |
| aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg | 6409 |
| Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala | |
| 1525 1530 1535 | |
| gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac | 6457 |
| Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp | |

| 1540 | | | | | 1545 | | | | | 1550 | | | | | |
|---|------|--|--|--|------|--|--|--|--|------|--|--|--|--|--|
| agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac | 6505 | | | | | | | | | | | | | | |
| Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp | | | | | | | | | | | | | | | |
| 1555 1560 1565 | | | | | | | | | | | | | | | |
| gcg gga tcc gac gtt gag tgc tac tcc tcc atg ccc ccc ctt gag ggg | 6553 | | | | | | | | | | | | | | |
| Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly | | | | | | | | | | | | | | | |
| 1570 1575 1580 | | | | | | | | | | | | | | | |
| gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc | 6601 | | | | | | | | | | | | | | |
| Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser | | | | | | | | | | | | | | | |
| 1585 1590 1595 1600 | | | | | | | | | | | | | | | |
| gag gag gct agt gag gac gtc gtc tgc tgc tgc atg tcc tac aca tgg | 6649 | | | | | | | | | | | | | | |
| Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp | | | | | | | | | | | | | | | |
| 1605 1610 1615 | | | | | | | | | | | | | | | |
| aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc | 6697 | | | | | | | | | | | | | | |
| Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro | | | | | | | | | | | | | | | |
| 1620 1625 1630 | | | | | | | | | | | | | | | |
| atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat | 6745 | | | | | | | | | | | | | | |
| Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr | | | | | | | | | | | | | | | |
| 1635 1640 1645 | | | | | | | | | | | | | | | |
| gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt | 6793 | | | | | | | | | | | | | | |
| Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe | | | | | | | | | | | | | | | |
| 1650 1655 1660 | | | | | | | | | | | | | | | |
| gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag | 6841 | | | | | | | | | | | | | | |
| Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu | | | | | | | | | | | | | | | |
| 1665 1670 1675 1680 | | | | | | | | | | | | | | | |
| atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag | 6889 | | | | | | | | | | | | | | |
| Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu | | | | | | | | | | | | | | | |
| 1685 1690 1695 | | | | | | | | | | | | | | | |
| gaa gcc tgt aag ctg acg ccc cca cat tgc gcc aga tct aaa ttt ggc | 6937 | | | | | | | | | | | | | | |
| Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly | | | | | | | | | | | | | | | |
| 1700 1705 1710 | | | | | | | | | | | | | | | |
| tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac | 6985 | | | | | | | | | | | | | | |
| Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His | | | | | | | | | | | | | | | |
| 1715 1720 1725 | | | | | | | | | | | | | | | |
| atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att | 7033 | | | | | | | | | | | | | | |
| Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile | | | | | | | | | | | | | | | |
| 1730 1735 1740 | | | | | | | | | | | | | | | |
| gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag | 7081 | | | | | | | | | | | | | | |
| Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu | | | | | | | | | | | | | | | |
| 1745 1750 1755 1760 | | | | | | | | | | | | | | | |
| aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg | 7129 | | | | | | | | | | | | | | |

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|---|------|
| Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly | |
| 1765 1770 1775 | |
| gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc | 7177 |
| Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu | |
| 1780 1785 1790 | |
| cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga | 7225 |
| Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly | |
| 1795 1800 1805 | |
| cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct | 7273 |
| Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro | |
| 1810 1815 1820 | |
| atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag | 7321 |
| Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu | |
| 1825 1830 1835 1840 | |
| aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc | 7369 |
| Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala | |
| 1845 1850 1855 | |
| ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc | 7417 |
| Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile | |
| 1860 1865 1870 | |
| ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg | 7465 |
| Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg | |
| 1875 1880 1885 | |
| tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca | 7513 |
| Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr | |
| 1890 1895 1900 | |
| tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac | 7561 |
| Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp | |
| 1905 1910 1915 1920 | |
| tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc | 7609 |
| Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser | |
| 1925 1930 1935 | |
| gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct | 7657 |
| Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala | |
| 1940 1945 1950 | |
| atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac | 7705 |
| Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr | |
| 1955 1960 1965 | |
| gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac | 7753 |
| Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His | |
| 1970 1975 1980 | |

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|---|------|
| gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc | 7801 |
| Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr | |
| 1985 1990 1995 2000 | |
| ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat | 7849 |
| Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn | |
| 2005 2010 2015 | |
| tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg | 7897 |
| Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg | |
| 2020 2025 2030 | |
| atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa | 7945 |
| Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln | |
| 2035 2040 2045 | |
| ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att | 7993 |
| Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile | |
| 2050 2055 2060 | |
| gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc | 8041 |
| Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser | |
| 2065 2070 2075 2080 | |
| gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct | 8089 |
| Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala | |
| 2085 2090 2095 | |
| tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat | 8137 |
| Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His | |
| 2100 2105 2110 | |
| cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct | 8185 |
| Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala | |
| 2115 2120 2125 | |
| gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc | 8233 |
| Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu | |
| 2130 2135 2140 | |
| aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg | 8281 |
| Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp | |
| 2145 2150 2155 2160 | |
| ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt | 8329 |
| Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg | |
| 2165 2170 2175 | |
| gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg | 8377 |
| Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly | |
| 2180 2185 2190 | |
| gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca | 8427 |
| Val Gly Ile Tyr Leu Leu Pro Asn Arg * | |
| 2195 2200 | |

| | | | | | | |
|------------|------------|------------|------------|------------|------------|------|
| ggccaatagg | ccatcctggt | tttttccctt | tttttttttc | tttttttttt | tttttttttt | 8487 |
| tttttttttt | ttttctcctt | tttttttcct | ctttttttcc | ttttctttcc | tttggtggct | 8547 |
| ccatcttagc | cctagtcacg | gctagctgtg | aaaggtccgt | gagccgcttg | actgcagaga | 8607 |
| gtgctgatac | tggcctctct | gcagatcaag | t | | | 8638 |